

# Rhodora

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### STUDIES IN THE FLORA OF BOLIVIA, — III. CYPERACEAE, PART 1.

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This treatment of the Bolivian *Cyperaceae* is complete except for the genus *Cyperus*, which will constitute Part 2 of the family treatment. Since it is floristic, rather than monographic, synonymy has mostly been limited to names, some based on misidentifications, which were included in my Catalogue of the Ferns and Flowering Plants of Bolivia (Contrib. Gray Herb. no. 184 [1958]), but which now seem properly relegated to synonymy. In a few instances, I have not seen Bolivian material of species, but after the Bolivian specimens cited I have placed in parentheses the name of a previous worker who had seen them.

A generic description is given whenever two or more species of a genus are treated. When only one species of a genus occurs in Bolivia, a combined generico-specific description is given, to prevent unnecessary repetition. It should be emphasized that generic descriptions are based solely on the Bolivian representatives of a genus.

For the most part, the treatment is based on the collections of the Gray Herbarium (GH). I have, however, received supplementary material from the New York Botanical Garden (NY), the United States National Herbarium (US) and the Missouri Botanical Garden (MO). I am much indebted to the curators of these institutions for making their specimens available. Above all, I am most grateful to Dr. Lyman B. Smith for his patience in answering questions and his kindness in searching for material which would be helpful to me.

## KEY TO GENERA

- a. Flowers unisexual.
  - b. Rachilla of pistillate flowers prolonged and conspicuous. .... 14. *Uncinia*.
  - b. Rachilla neither prolonged nor conspicuous.
    - c. Achene covered by a puberulent membrane or by a perigynium.
      - d. Achene enclosed in a puberulent membrane; staminate flower a single stamen. .... 12. *Calyptracarya*.
      - d. Achene enclosed in a perigynium; staminate flower of 3 stamens. .... 15. *Carex*.
    - c. Achene not covered by a membrane nor by a perigynium. .... 13. *Scleria*.
- a. Flowers perfect (at least some of them).
  - e. Leaf-blades absent. .... 7. *Eleocharis*.
  - e. Leaf-blades present (sometimes much reduced).
    - f. Style-base persistent on the achene.
      - g. Style-base a tubercle. .... 9. *Bulbostylis*.
      - g. Style-base a beak.
        - h. Perianth present (of scales or bristles).
          - i. Achene surrounded by a transparent scale or utricle. .... 3. *Ascolepis*.
          - i. Achene surrounded by scales or bristles.
            - j. Perianth of 3 flattened scales alternating with 3 bristles (or the bristles absent). .... 5. *Fuirena*.
            - j. Perianth of bristles only (flattened scales absent). .... 11. *Rhynchospora*.
        - h. Perianth absent. .... 11. *Rhynchospora*.
    - f. Style-base not persistent on the achene.
      - k. Perianth-bristles present. .... 4. *Scirpus*.
      - k. Perianth-bristles absent.
        - l. Inner scales present in flowers.
          - m. Inner scales 2, like a 2-valved utricle. .... 1. *Lipocarpa*.
          - m. Inner scale 1, small, between achene and axis of spikelet. .... 2. *Hemicarpa*.
        - l. Inner scales absent in flowers.
          - n. Spikelets mostly many-flowered.
            - o. Spikelet-scales 2-ranked, conduplicate. .... 6. *Cyperus*.
            - o. Spikelet-scales spirally arranged.
              - p. Style-base thickened or dilated. .... 8. *Fimbristylis*.
              - p. Style-base not thickened. .... 4. *Scirpus*.
          - n. Spikelets mostly 1-2 (-few)-flowered. .... 10. *Cladium*.

## 1. LIPOCARPHA R. Br.

**Lipocarpa Sellowiana** Kunth, Enum. Pl. 2: 267 (1837). Caespitose perennial to 8 dm. tall. Culms slender, rigid, triangular. Leaves few, basal, shorter than the culms, basal sheaths often reddish or purplish,

blades subterete, canaliculate, the apex obtuse. Involucre of 2-3 foliar bracts, the lowermost to 12 cm. long, the others much shorter. Inflorescence of 2 to several sessile, ovoid or subglobose spikes forming a dense capitulum. Glumes imbricate, to 2 mm. long, obovate to cuneate with a broad terminal acumen, many-nerved, striate, subtending axillary perfect flowers of 1-2 stamens and trifid style, these surrounded by a 2-valved utricle with one scale adaxial, the other abaxial, the 2 parts more or less transparent, membranous, many-nerved, elliptic-ovate and more or less concealed by the glumes. Achene to 1.3 mm. long, basally attenuate, obscurely trigonous. SANTA CRUZ: SARA: Buenavista, 450-500 m., *Steinbach* 1902 (GH), 5140 (GH), 6895 bis (GH).

## 2. HEMICARPHA Nees & Arn.

**Hemicarpha micrantha** (Vahl) Pax in Engl. & Prantl, Nat. Pflanzenfam. 2(2): 105 (1887). *Scirpus micranthus* of the Catalogue. Dwarf annual with dark fibrous roots. Culms to 9 cm. high, often much shorter, capillary, smooth. Leaves much shorter than culms, capillary, subterete, sheath-orifice oblique. Inflorescence terminal, pseudolateral, of 1-3 spikelets, involucre bract much exceeding spikelets and appearing as a continuation of the culm. Spikelets ovoid to oblong-ovoid, to 2 mm. long; scales brown with light streaks, oblong-ovate, to 1 mm. long, but usually not much exceeding the achene, not carinate; a small translucent scale between the achene and spikelet-axis; perianth-bristles 0; stamens 1; style bifid. Achene narrowly obovoid, briefly apiculate at the abruptly obtuse apex, about 0.5 mm. long, pale brown until full maturity, then dark brown, minutely and evenly papillate in longitudinal rows, style-base not persistent as a tubercle. SANTA CRUZ: SARA: Buenavista, 450 m., *Steinbach* 1919 (GH).

## 3. ASCOLEPIS Nees

**Ascolepis brasiliensis** (Kunth) Benth. ex C. B. Clarke in Dur. & Schinz, Conspect. Fl. Afr. 5: 651 (1894). Perennial, from a more or less horizontal slender rhizome, to 6 dm. tall. Culms slender to filiform. Leaves basal, few in a tuft, shorter than the culms, filiform, basally sheathing. Involucre of 1-3 unequal bracts, the longest to 9 cm. long. Inflorescence capitate, of 1-3 dense, ovoid to globose sessile spikes to 8 mm. long. Spikelets spirally inserted on the rachis of the spike, each consisting of a long-triangular or long-deltoid several-nerved glume to 2 mm. long and less than 1 mm. wide at the base, subtending a flattened, oval, several-nerved scale or utricle to 2.5 mm. long, the apex abruptly acuminate, the wide margins hyaline, this containing the perfect flower of 1-2 stamens and bifid style, the style-base persistent on the oblong, biconvex, basally attenuate achene, the achene-coat shining brown, finely reticulate. SANTA CRUZ: SARA: Buenavista, 450 m., *Steinbach* 6727 (GH).

## 4. SCIRPUS L.

Annual or perennial, in wet or damp habitats. Plants dwarf to very tall, the culms filiform to broad-trigonous. Leaves with basal sheaths, the blades mostly short and narrow, or greatly reduced. Inflorescence terminal, reduced to 1-many spikelets, pseudolateral in some species. Spikelets few- to several-flowered, the lowest scales empty, flowers perfect, perianth-bristles present or absent; stamens 2-3; style bifid or trifid. Achene plano-convex or trigonous, smooth or somewhat reticulate or scrobiculate.

## a. Inflorescence not pseudolateral.

## b. Perianth-bristles 0.

## c. Achene contracted apically into a short neck.

d. Culms to 2 dm. high; achene trigonous. .... 2. *S. cernuus*.d. Culms to 3 cm. high; achene plano-convex. .. 4. *S. boliviensis*.c. Achene not contracted apically into a neck, but abruptly rounded-obtuse. .... 5. *S. atacamensis*.

## b. Perianth-bristles present.

e. Inflorescence sessile; leaves in a rosette; achene pale. .... 8. *S. acaulis*.e. Inflorescence not sessile; leaves not in a rosette; achene dark. .... 9. *S. deserticola*.

## a. Inflorescence pseudolateral.

## f. Culms to 2.5 dm. tall, 0.5-1 mm. wide; perianth-bristles 0.

g. Achene pale brown or stramineous, plano-convex. .. 1. *S. rigidus*.g. Achene shiny black or deep brownish-black, trigonous. .... 3. *S. inundatus*.

## f. Culms 0.5-2 m. tall, 2-10 mm. wide; perianth-bristles present.

## h. Leaf-blades present; perianth-bristles not plumose.

i. Inflorescence a single capitulum; spikelet-scales bilobed or emarginate. .... 6. *S. americanus*.i. Inflorescence anthelate; spikelet-scales not bilobed nor emarginate. .... 7. *S. asper*.h. Leaf-blades rudimentary or absent; perianth-bristles plumose-ciliate. .... 10. *S. californicus*.

1. *Scirpus rigidus* Boeckl. in *Linnaea*, 36: 492. (1870). Stiff, rigid perennial, the fasciculate stems to 2.5 dm. tall, more or less angular-terete, striate, glabrous, smooth or scabrid above. Leaves shorter than the culms, mostly less than 1 mm. wide, glabrous, the margins scabridulous, apex obtuse, sheath-orifice oblique and attenuate. Inflorescence usually a solitary pseudolateral spikelet subtended by 2 bracts, the lower foliar, appearing as a continuation of the culm, somewhat exceeding the spikelet. Spikelet to 1 cm. long; scales oval, obtuse, the lowermost broadly carinate and muticous, yellowish or stramineous below and warm brown above; bristles 0; stamens 3; style deeply trifid, not enlarged at the base. Achene to 2.3 mm. long, obovoid, plano-convex (or subtrigonous), apex abruptly rounded-obtuse, shiny

black or brownish-black. LA PAZ: LARECAJA: Caypichuru, 3500-4200 m., *Mandon* 1412 (GH).

2. *S. cernuus* Vahl, Enum. 2: 245 (1806). Dwarf caespitose annual. Culms to 2 dm. high, but usually shorter, filiform, striate-sulcate, smooth. Leaves mostly shorter than the culms, filiform; sheath-orifice oblique, unilaterally produced as a long, broad, obtuse apiculus. Inflorescence of 1(-3) terminal pseudolateral spikelets, subtended by 2 bracts, the lower appearing as a continuation of the culm, hardly or only somewhat exceeding the spikelet. Spikelets to 1 cm. long, usually shorter; scales carinate, the midrib excurrent as a very short blunt apiculus, the midrib green, margins bright reddish-chestnut; bristles 0; stamens (1-) 3; style trifid. Achene obovoid, trigonous, obtuse, with a short apiculus nearly 1 mm. long, obscurely to plainly reticulate. LA PAZ: LARECAJA: near Millipaya, 3200-3700 m., *Mandon* 1409 (GH); MURILLO: near La Paz, 3300 m., *Bang* 71 (GH).

3. *S. inundatus* (R. Br.) Spreng. Syst. Veg. 1: 207 (1825). Perennial from a filiform, branched, spreading rhizome. Culms to 2.5 dm. tall, setaceous. Leaves mostly shorter than the culms, to 1 mm. wide, flat; sheath-orifice oblique and the sheath prolonged unilaterally. Inflorescence pseudolateral, of 2-several spikelets aggregated in a capitulum, subtended by 2 bracts, the lower erect, exceeding the head and appearing to be a continuation of the culm; spikelets ovoid, 4-12 mm. long; scales ovate, obtuse or mucronulate, somewhat carinate, the keel green, the borders pale or hyaline; bristles 0; stamens 1-2(-3); style trifid. Achene ellipsoidal, trigonous, the apex acute, to 0.6 mm. long, finely or obscurely reticulate, pale brown or stramineous. LA PAZ: LARECAJA: Cochipata, etc., 3000-3800 m., *Mandon* 1406 (GH); near Acouma, *Mandon* 1407 (GH).

4. *S. boliviensis* M. Barros in Darwiniana, 11: 764 (1959). Dwarf perennial from an erect branching rhizome. Culms to 3 cm. high, obtusely trigonous. Leaves few (3-5), shorter than the culms, the sheaths loose, 6-7 mm. long, the blades 4-5 mm. long. Inflorescence a single terminal ebracteate spikelet about 3 mm. in diameter; scales broadly ovate, obtuse, fuscous, at least the lowermost mucronulate; bristles 0; stamens 2; style bifid or trifid. Achene about 1.2 mm. long, suborbicular, the apex abruptly obtuse and contracted into a short neck, plano-convex, slightly reticulate, pale-castaneous or fuscous. POTOSÍ: CERCADO: Potosí, *Petersen & Hjerting* 1043b (type-number; not seen).

As no material of this species has been available, this description has been based on the original description and figure.

5. *S. atacamensis* (Phil.) Boeckl. in Linnaea, 36: 482 (1870). Perennial, caespitose, from a descending rhizome. Culms to 6 cm.

high. Leaves shorter than the culms, rigid, canaliculate, the margins scabrid on the upper portion. Inflorescence usually a single, terminal, few-flowered spikelet about 6-7 mm. long, the subtending bract not foliar but resembling a scale; scales elliptic-ovate, obtuse, stramineous with brown striations; bristles 0; stamens 3; style trifid. Achene to 1.5 mm. long, plano-convex, obovoid, olivaceous to brownish, shining, the apex abruptly rounded-obtuse. Without data: *Bang* 1882 (GH).

The specimen cited resembles *S. rigidus* vegetatively, but the achene is that of *S. atacamensis*.

6. *S. americanus* var. *polyphyllus* (Boeckl.) Beetle in Amer. Journ. Bot. 30: 399 (1943). *S. americanus* subsp. *polyphyllus* (Boeckl.) T. Koyama in Canad. Journ. Bot. 41: 1118 (1963). Perennial from a rather stout rhizome. Culms to 8 dm. tall, glaucous, acutely trigonous, the sides flat. Leaves few, mostly sheathing, the produced blades seldom equaling the inflorescence, basally flattened, the apex trigonous, pungent; sheath-orifice oblique. Inflorescence pseudolateral, a capitulum of 1-6 spikelets, subtended by a bract much exceeding the capitulum and appearing as a continuation of the culm. Scales chestnut-brown, the midrib pale, bilobed with a central mucro equal to or shorter than the lobes; bristles 3-6, exceeding the achene, barbs very large; stamens 3; style bifid (occasionally trifid). Achene obovoid, pale to dark brown, to 2.3 mm. long, plano-convex, apically prolonged into a short neck. COCHABAMBA: CERCADO: near Cochabamba, *Bang* 997 (GH). POTOSÍ: CHICHAS: road from Quechisla to Chorolque, 3600 m., *Cárdenas* 36 (GH).

7. *S. asper* Presl, Rel. Haenk. 1: 194 (1830). Perennial from a rather woody ascending rootstock. Culms to 8 dm. tall, trigonous, the angles scabrid on the upper portion. Leaf-blades long, to 1 cm. wide, often glaucous, the margins scabrid; sheath-orifice truncate to shortly oblique, the margin finely ciliolate. Inflorescence terminal, compound-anthelate, of several to many capitula, subtended by 2-3 foliar involucre bracts, at least the lowermost exceeding the inflorescence and appearing as a continuation of the culm. Spikelets fasciculate (occasionally solitary), oblong, to 1.2 cm. long; scales ovate, broadly carinate, mucronate, reddish-brown, the keel green, the margin ciliate, especially at the apex; bristles 6, of varying lengths, the longest exceeding the achene; stamens 3; style trifid. Achene ovoid to obovoid, trigonous, to 1.2 mm. long, the apex prolonged into a short neck, smooth, pale (almost white) to brownish. LA PAZ: MURILLO: La Paz, 3460 m., *Buchtien* 529 (GH); Cotaña, 2450 m., *Buchtien* 3141 (GH); Capi, *Bang* 765 (GH).

8. *S. acaulis* Boeckl. in *Linnaea*, 36: 494 (1870). Acaulescent perennial from a slender creeping rhizome. Leaves numerous in a flattened rosette, the basal sheath large and much dilated, the apex

more or less obtuse, canaliculate, to 2.5 cm. long, narrow. Inflorescence a sessile capitulum of several to many spikelets, about 7 mm. long. Spikelets oblong, many-flowered (about 8); scales densely aggregated, to 6 mm. long, lance-elliptic, the back green, the sides brownish, apex acute; bristles 5-6, whitish; stamens 3; style long, trifid. Achene obovoid, trigonous, to 1.5 mm. long, the apex acuminate, pale in color, smooth. LA PAZ: MUÑECAS: cordillera above Carabuco, 4200 m., *Buchtien* 6388 (US).

9. *S. deserticola* Phil. Fl. Atac. 53 (1860). Dwarf, densely caespitose perennial from creeping, scaly, slender, much-branched rhizomes. Culms to 10 cm. tall, usually shorter. Leaves very short, much shorter than the culms, the membranous sheathing base somewhat enlarged, blades to 2 cm. long, scabrid on the margins. Inflorescence a solitary terminal (not pseudolateral) capitulum about 1 cm. long, of 2-3 (rarely 1) spikelets, the involucrel bracts shorter than the capitulum. Spikelets ovoid-oblong; scales ovate or lance-ovate, the margins pale brown, the broad midrib stramineous to greenish, somewhat excurrent; bristles 3-6, the longest exceeding the achene; stamens 3; style trifid. Achene ellipsoid, trigonous, to 1.5 mm. long, brown, the apex prolonged almost like an apiculus, the surface finely reticulate-scrobiculate. LA PAZ: LARECAJA: Lacatia, etc., *Mandon* 1417 (GH). POTOSÍ: CHICHAS: near Chorolque, 3500 m., *Cárdenas* 62 (GH).

10. *S. californicus* (C. A. Mey.) Steud. Nomencl. (ed. 2) 2: 538 (1841). *S. riparius* of the Catalogue. Perennial from a thick horizontal rhizome. Culms to 1.8 m. high, obtusely trigonous, to 1 cm. wide, smooth. Leaves reduced to thin membranous sheaths, the uppermost with rudimentary blades. Inflorescence a large, terminal, compound anthela, subtended by a single large involucrel bract to 5 cm. long, appearing as a continuation of the culm, the inflorescence thus pseudolateral. Spikelets solitary at ends of secondary rays, to 1.8 cm. long; scales broadly ovate to obovate, to 4 mm. long, the apex entire or emarginate, ciliate, long-mucronate, brown or reddish-brown, the midrib and mucro green; bristles 3, plumose-ciliate, equaling the achene; stamens 3; style bifid. Achene to 2.25 mm. long, obovoid, plano-convex, the apex produced as a short apiculus, grayish to brownish, finely scrobiculate. TARIJA: ARCE: Bermejo, 1400 m., *Fiebrig* 2311 (GH).

##### 5. FUIRENA Rottb.

*Fuirena umbellata* Rottb. Descr. & Icon. 70, t. 19, fig. 3 (1773). Perennial from a creeping rhizome. Culms to 8 dm. tall. Leaves cauline, basally long-sheathing, the linear-lanceolate blades to 18 cm. long and 1.2 cm. wide, acute, scabrid above and beneath, the ligule puberulent or shortly pubescent. Inflorescence of terminal and axillary corymbs. Spikelets few- to many-flowered, on villous peduncles and

pedicels, oblong-ovoid, acute, in groups of 3-15, to 7 mm. long. Glumes obovate, red-brown, with 3 prominent green dorsal nerves, the upper half pubescent, 2 mm. long, terminated by a short, thick, straight mucro originating shortly below the apex. Perianth of 3 membranous, flattened, stipitate, ovate, aristate, 3-nerved scales, alternating with 3 bristles (or these absent), surrounding 3 stamens and an obovoid trigonous achene crowned with the persistent base of the trifid style. LA PAZ: CAUPOLICÁN: Apolo, *R. S. Williams* 917 (GH); Ixiamas, 330 m., *Cárdenas* (M. E.)\* 1950 (GH). SANTA CRUZ: SARA: Buena-vista, 500 m., *Steinbach* 5217 (GH).

#### 7. ELEOCHARIS R. Br.

See Svenson in *Rhodora*, 31: 121-135, 151-163, 167-191, 199-219, 224-242 (1929); 34: 193-203, 215-227 (1932); 35: 377-389 (1934); 39: 210-231, 236-273 (1937); 41: 1-19, 43-77, 90-110 (1939).

Annual or perennial leafless aquatics or semi-aquatics. Culms septate or not septate, angled or terete, with bladeless basal sheaths. Inflorescence a single terminal spikelet, few- to many-flowered, the lowest scales empty, the central scales with perfect flowers, the uppermost scales staminate or sterile. Perianth present as hypogynous bristles (rarely absent), the bristles retrorsely barbed or smooth. Stamens 1-3. Style bifid or trifid, glabrous, the bulbous thickened base persistent on the achene as a tubercle. Achene lenticular, biconvex or trigonous.

a. Culms septate.

b. Culms 1-2 mm. wide; spikelet much wider than the culms. .... 10. *E. nodulosa*.

b. Culms 5-10 mm. wide; spikelet hardly or not at all wider than the culm.

c. Achene 2 mm. long, longitudinally ribbed and pitted, the cells rectangular; style-base broadly pyramidal. .... 2. *E. interstincta*.

c. Achene 1.5 mm. long, scrobiculate; style-base lanceolate, half the length of the achene. .... 11. *E. elegans*.

a. Culms not septate.

d. Sheath oblique at orifice.

e. Achene apically narrowed to a neck.

f. Neck of achene broadened upward. .... 1. *E. fistulosa*.

f. Neck not broadened upward. .... 3. *E. radicans*.

e. Achene lacking an apical neck.

g. Achene black or deep brownish-black. .... 6. *E. geniculata*.

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\*The initials M. E. refer to specimens collected on the Mulford Biological Exploration. The number-series of these collections duplicate other number-series of the same collectors.



- g. Achene white, greenish or brownish.
- h. Achene obovoid, greenish to brownish, 1.5 mm. long. .... 9. *E. albibracteata*.
- h. Achene ovoid, white to brownish, 1 mm. long.
- i. Scales lance-ovate, acute, not emarginate at apex. .... 12. *E. minima*.
- i. Scales mostly oblong, obtuse, at least some emarginate at apex. .... 13. *E. filiculmis*.
- d. Sheath truncate at orifice.
- j. Sheath bifid at apex.
- k. Achene shiny black. .... 4. *E. maculosa*.
- k. Achene greenish-yellow to olivaceous, never black.
- l. Achene olivaceous, with a short apical neck. .... 5. *E. Sellowiana*.
- l. Achene greenish-yellow, without an apical neck. .... 8. *E. crinalis*.
- j. Sheath not bifid at apex. .... 7. *E. Dombeyana*.

1. *Eleocharis fistulosa* (Poir.) Schult. Mant. 2: 89 (1824). Culms not septate, acutely trigonous, to 6 dm. high, the coarse roots reddish-brown; sheaths thin, membranous, loose, the orifice oblique, acute, pale reddish-brown. Spikelets to 3 (-3.5) cm. long, as wide as the culm, or sometimes a little wider; scales to 4 mm. long, broadly ovate, subacute or obtuse, firm, conspicuously striate, stramineous to gray, the very narrow, thin, white margin erose; stamens 3; style trifold. Achene about 2 mm. long, obovoid, greenish to light brown, with about 20 rows of deep quadrangular to oblong-hexagonal cells, apex narrowed to a neck and broadened upward to the style-base; bristles 6, exceeding the achene. SANTA CRUZ: SARA: Buenavista, 450 m., *Steinbach* 7444 (GH).

2. *E. interstincta* (Vahl) Roem. & Schult. Syst. Veg. 2: 149 (1817). Culms septate, terete, to 10 dm. high and 5 mm. wide, from a short thick caudex with coarse red-brown or light brown roots; sheaths membranous, the orifice oblique and acute. Spikelet to 4 cm. long, more or less cylindrical, as wide as or a little wider than the culm; scales oblong, obtuse to subacute, striate, stramineous to gray, with a rather broad, thin, white-hyaline, erosulous margin; stamens 3; style bifid or trifold. Achene 2 mm. long, yellow to gray, longitudinally ribbed and pitted, the cells transversely rectangular and prominent, narrowed to a marked apical annulus (but not narrowed into a neck), the style-base broadly pyramidal, dark brown; bristles 6, exceeding the achene, broad. BENI: YACUMA: near Lake Rogagua, 330 m., *Rusby* (M. E.) 1422 (GH). SANTA CRUZ: SARA: Río Curichi, 450 m., *Steinbach* 1917 (GH); Buenavista, 450-500 m., *Steinbach* 7445 (GH), 7043bis (GH), 5216 (GH).

3. *E. radicans* (Poir.) Kunth, Enum. Pl. 2: 142 (1837). *E. exigua* and *E. costulata* of the Catalogue. Perennial from filiform creeping

rootstocks. Culms to 1 dm. tall, filiform or capillary, not septate, often recurved, somewhat angular; sheath greenish-scarious, the orifice oblique and acute. Spikelet to 3 mm. long, wider than the culm, scales greenish, often with a broad purple margin, striate, lance-oblong to oblanceolate, obtuse to subacute; stamens 2; style trifid. Achene 1 mm. long, obovoid, yellowish-green to nearly white, obscurely trigonous with about 15 elevated longitudinal ribs, the inter-costal areas about 40-trabeculate, the cells narrowly rectangular, the apex constricted into a neck, but not dilated upward into the dark-green acute style-base; bristles 2 (or 0), white. LA PAZ: LARECAJA: Mapiri, *Bang* 1503 (GH); between Cochipata and Millipaya, 3100 m., *Mandon* 1413 (GH).

4. ***E. maculosa*** (Vahl) Roem. & Schult. Syst. Veg. 2: 154 (1817). Perennial, with long, slender, scaly, chestnut-brown stolons. Culms to 3.5 dm. long, not septate, more or less quadrangular and canaliculate, smooth, rigid and erect; uppermost sheaths scarious at apex, enlarged, rugose, the orifice truncate, bifid. Spikelet to 1.2 cm. long, much broader than the culm, lanceolate to ovoid; scales broadly ovate, obtuse, firm-textured, shining, purplish-brown, the scarious margin erosulous; stamens 3; style bifid. Achene to 1 mm. long, obovoid, shiny black, the surface minutely striatulate, narrowed apically to a very short neck, this not enlarged below the style-base; style-base dilated at base, half the achene-width, light-brown, the beak subulate; bristles 7-8, unequal, at least some equaling the achene, teeth small, numerous. LA PAZ: CAUPOLICÁN: Apolo, *R. S. Williams* 914 (Svenson).

5. ***E. Sellowiana*** Kunth, Enum. Pl. 2: 149 (1837). *E. ocreata* var. *flaccida* of the Catalogue. Annual, with rather pale slender roots. Culms not septate, to 1.5 dm. tall, or occasionally to 3.5 dm., to 2 mm. wide, striate, slightly constricted below the spikelet; sheaths hyaline at the truncate unilaterally bifid apex. Spikelet to 1 cm. long, wider than the culm, ellipsoid; scales oblong, obtuse, stramineous (or somewhat pale yellow-green), with a narrow brown stripe on each side of the scarcely keeled midrib; stamens 3; style bifid. Achene to 1 mm. long, obovoid, lenticular, olivaceous, shiny, punctulate-striate, the striae sometimes dark or blackish, narrowed abruptly at the apex into a very short neck, style-base shortly conic, yellow-green, less than half the width of the achene; bristles 7-8, white, shorter than the achene. LA PAZ: CAUPOLICÁN: Apolo, *R. S. Williams* 909 (Svenson). SANTA CRUZ: SARA: Curiche de Piedritas, 450 m., *Steinbach* 2870 (GH).

6. ***E. geniculata*** (L.) Roem. & Schult. Syst. Veg. 2: 150 (1817). *E. capitata* and *E. geniculata* of the Catalogue. Annual (occasionally stoloniferous?). Culms to 4 dm. high, not septate, more or less terete, sulcate; sheaths basally brown, stramineous above, the orifice oblique and subacute. Spikelets to 0.8 cm. long, ovoid to subglobose, much

wider than the culms; scales suborbicular to ovate, obtuse, yellow to pale brown with a very narrow, poorly defined, hyaline margin; stamens 2-3; style bifid. Achene about 1 mm. long, obovoid, more or less biconvex or obscurely trigonous, not narrowed into an apical neck, shiny, deep brownish-black or black, the style-base mostly depressed, whitish to brownish; bristles 6-8 (or 0), brown, broad-based, the barbs conspicuous. BENI: YACUMA: near Lake Rogagua, *Mulford Exploration* 2519½ (GH). LA PAZ: SUR YUNGAS: cataracts of the Río Bopi, 1000 m., *Rusby* (M. E.) 738 (GH). SANTA CRUZ: SARA: Río Perdix, 450 m., *Steinbach* 7454 (GH).

7. *E. Dombeyana* Kunth, Enum. Pl. 2: 145 (1837). Perennial from slender, scaly, red-brown rhizomes. Culms to 3 dm. tall, not septate, subterete, sulcate; sheaths basally deep brown, stramineous at the truncate apiculate orifice. Spikelets to 1 cm. long, ovoid to lance-linear, much wider than the culms; scales elliptic to ovate, obtuse, brown, the midrib yellow or green, the margin hyaline (at least on the lowest scales); stamens 3; style trifid. Achene to 1.3 mm. long, obovoid, trigonous, not narrowed to an apical neck, shiny, yellow or brown, the surface faintly reticulate, the style-base elongate, acute (mucroniform); bristles 4, brown, longer or shorter than the achene. LA PAZ: MURILLO: La Paz, *Buchtien* 149 (GH), 8824 (GH), *Bang* 144 (GH). COCHABAMBA: CERCADO: near Cochabamba, *Bang* 996 (GH).

8. *E. crinalis* (Griseb.) C. B. Clarke in Kew Bull. Add. Ser. 8: 23 (1908). *E. boliviana* and *E. Brehmeriana* of the Catalogue. Perennial. Culms filiform, in remote clumps from a long, slender, scaly rhizome, to 2 dm. high (rarely higher), not septate, sulcate, angled; sheaths reddish or reddish-brown at the base, the apex darker or lighter, orifice truncate and briefly bifid. Spikelets to 6 mm. long, ovate to elliptic, much broader than the culms; scales ovate to lanceolate, mostly obtuse to subacute, not (or hardly) carinate, deep chestnut-brown to reddish, the midrib paler; stamens 3; style trifid. Achene to 1 mm. long, greenish-yellow, ovoid to suborbicular, obscurely trigonous, the 3 angles thickened, longitudinally striatulate, faintly reticulate, style-base acuminate-deltoid, brownish; bristles pale-brown, slender, about equaling the achene. LA PAZ: MURILLO: Cotaña, 2000-2900 m., *Mandon* 1416 in part (GH; type-number of *E. Brehmeriana*), 2450 m., *Buchtien* 3143 (GH); La Paz, 3750 m., *Buchtien* 4482 (GH; type-number of *E. boliviana*). TARIJA: ARCE: Padcaya, 2100 m., *Fiebrig* 2524 (GH).

9. *E. albibracteata* Nees & Meyen ex Kunth, Enum. Pl. 2: 143 (1837). *E. nubigena* of the Catalogue. *E. albibracteata* var. *nubigena* (C. B. Clarke) M. Barros in Gen. & Sp. Pl. Argent. 4(1): 179 (1947). Perennial from a rather woody spreading rootstock. Culms filiform, mostly less than 1 dm. long; sheath-orifice oblique, acute. Spikelets to 6 mm. long, wider than the culms; scales ovate, dark brown, the

margin hyaline, entire, the midrib green, obtuse to acute; stamens 3; style trifid. Achene to 1.5 mm. long, obovoid, trigonous, the angles thickened and broad, greenish to brownish, faintly striatulate or reticulate, style-base pyramidal to conic, with a basal ridge at junction with the achene; bristles 3-4, slender, exceeding the achene, occasionally shorter. LA PAZ: LARECAJA: Cochipata, etc., 3100-4100 m., *Mandon* 1414 in part (Gray Herbarium sheet mixed with a very dwarf *Carex*); MURILLO: La Paz, 3300 m., *Bang* 71a (GH).

The variety *nubigena* seems to differ from the species only in the orifice of the sheath, and even this character seems somewhat variable.

10. **E. nodulosa** (Roth) Schult. Mant. 2: 87 (1824). Perennial from a creeping rhizome. Culms to 8 dm. tall, terete, septate, the septations approximate; sheaths long, stramineous, the orifice truncate, unilaterally apiculate. Spikelets to 2.7 cm. long, lance-oblong, wider than the culms; scales suborbicular to ovate, acute to obtuse, brown, the midrib often lighter in color, with a broad hyaline margin and apex; stamens 2; style bifid or trifid. Achene 1 mm. long, obovoid, biconvex, yellowish, brownish or olivaceous, regularly scrobiculate, the brown style-base flattened-deltoid, with a slight elevation at junction with achene; bristles equaling or somewhat exceeding the achene, red-brown. LA PAZ: CAUPOLICÁN: Apolo, *R. S. Williams* 911 (GH); NOR YUNGAS: Hacienda El Choro, Coripata, *Buchtien* 8065 (NY). COCHABAMBA: TOTORA: Pocona, 2500 m., *Steinbach* 8710 (GH). SANTA CRUZ: SARA: Buanavista, 500 m., *Steinbach* 5298 (GH).

11. **E. elegans** (HBK.) Roem. & Schult. Syst. Veg. 2: 150 (1817). *E. geniculata* of the Catalogue. Coarse perennial from a creeping rootstock. Culms septate, terete, to 1.5 m. high, to 1 cm. wide; sheaths reddish or pale, the orifice truncate and unilaterally briefly apiculate. Spikelets to 3 cm. long, subglobose to lanceolate to cylindrical, about as wide as the culm or a little wider; scales oblong to obovate, 2 mm. long, obtuse, not carinate, the midportion brown, the broad scarious margin pale brown to whitish; stamens 3; style bifid or trifid. Achene obovoid, 1.5 mm. long, biconvex or obscurely trigonous, the apex narrowed into a short neck, yellow to brown, more or less regularly scrobiculate, style-base dark brown, lanceolate, half the length of the achene; bristles exceeding the achene, dark brown. BENI: YACUMA: Lake Rogagua, *Rusby* 1602 (Svenson).

12. **E. minima** Kunth, Enum. Pl. 2: 139 (1837). Matted caespitose plants with whitish fibrous roots. Culms to 7 cm. tall, capillary, angular-sulcate, sheaths oblique at the orifice. Spikelets to 4 mm. long, much wider than the culms; scales lance-ovate, acute, dark brown, the midrib green, margin broad, hyaline, white; stamens 3; style trifid. Achene to 1 mm. long, ovoid, trigonous, apically narrowed

into a very brief neck, subreticulate to striatulate, whitish to olivaceous to brown, style-base short-pyramidal, gray or brown; bristles mostly whitish, not equaling the achene, obscurely barbed. SANTA CRUZ: SARA: Buenavista, 450-500 m., *Steinbach* 2208 (GH), 5499 (GH).

13. *E. filiculmis* Kunth, Enum. Pl. 2: 144 (1837). *E. sulcata* of the Catalogue. Perennial from an ascending caudex. Culms to 4 dm. tall, not septate, flattened, sulcate, slender, sometimes to 1 mm. wide; sheath purple-brown to stramineous, the orifice oblique. Spikelets to 1 cm. long, ovoid to cylindrical, much wider than the culms; scales more or less oblong, obtuse, often emarginate, stramineous to rufescent, the keel lighter, the broad margin scarious; stamens 3; style trifid. Achene 1 mm. long, ovoid, trigonous, shining white, subreticulate or striatulate, style-base pyramidal, almost as wide as the achene, the basal margin overhanging the achene; bristles about 6, white, nearly equaling the achene. COCHABAMBA: MIZQUE: near Vilavila, 2500 m., *Eyerdam* 24970 (GH). SANTA CRUZ: SARA: Dolores, 450 m., *Steinbach* 1900 (GH); Buenavista, 450-500 m., *Steinbach* 5340 (GH), 6946 (GH).

#### 8. FIMBRISTYLIS Vahl

Annual or perennial. Leaves filiform or linear. Inflorescence anthelate, with few to many heads, or reduced to a single terminal head. Spikelets several- to many-flowered, terete or ellipsoid (ovoid in one case), the glumes all, or mostly, floriferous, imbricate, several-ranked. Flowers perfect; perianth absent; stamens 3; style dilated at the base and abruptly constricted above the achene, bifid or trifid, not persistent on the achene; achene basally attenuate, apically short-apiculate, biconvex or trigonous, regularly ribbed and cancellate or tuberculate.

Inflorescence anthelate, with several to many spikelets; achenes not tuberculate.

Achenes 1 mm. or more in length, strongly ribbed and cancellate.

..... 1. *F. annua*.

Achenes less than 0.5 mm. long, not cancellate, the ribbing obscure.

..... 2. *F. aestivalis*.

Inflorescence reduced to a single head; achenes tuberculate, not ribbed. .... 3. *F. monostachya*.

1. *Fimbristylis annua* (All.) Roem. & Schult. Syst. Veg. 2: 95 (1817). Annual, to 8 dm. tall, glabrous, or in some forms the leaf-sheaths and involucral bracts pubescent. Inflorescence anthelate, involucrate, the lower bract as long as or much exceeding the anthela. Spikelets to 9 mm. long, elliptic, acute, the ovate glumes apiculate, not conspicuously keeled. Style bifid, ciliate on at least the upper portion. Achene 1 mm. long, or a little more, obovoid, biconvex, cancellate, with about 6 prominent longitudinal ribs on each face, the intercostal pitting regular and pronounced. YUNGAS: *Bang* 530 (GH). BENI

(?): Río Beni, *Rusby* 71 (GH). LA PAZ: LARECAJA: San Carlos, Mapiri, 600 m., *Buchtien* 304 (GH); NOR YUNGAS: Coripata, 1300 m., *Buchtien* 8066 (NY). SANTA CRUZ: SARA: Buenavista, 450 m., *Steinbach* 7035 (GH), 1071 (GH), 5141 (GH), 5337 (GH), 5466 (NY). BENI: YACUMA: Hacienda Rosario, near Lake Rogagua, 330 m., *Rusby* (M. E.) 1655 (GH).

2. *F. aestivalis* (Retz.) Vahl, Enum. 2: 288 (1806). Annual, with fibrous roots. Culms to 2.5 dm. high, filiform. Leaves filiform or very narrowly linear, mostly shorter than the anthelate inflorescence. Involucre of 2 bracts, the lower equaling or exceeding the inflorescence, the other very short. Glumes rather narrowly ovate, 1-1.5 mm. long, carinate, the keel green and excurrent as a short tooth. Style bifid. Achene less than 0.5 mm. long, pyriform, lenticular or obscurely trigonous, evenly papillose. BENI (?): Río Beni, *Rusby* 287 (GH).

Note: the typical form of this species is somewhat pubescent or pilose. This glabrous specimen was determined by H. K. Svenson.

3. *F. monostachya* (L.) Hassk. Pl. Jav. Rar. 61 (1848). Perennial, caespitose, or with a short rhizome, to 3 dm. tall. Leaves flat or canaliculate, shorter than the culms, acute, the margins scabrid. Inflorescence reduced to a single ovoid head (rarely 2), to 1.5 cm. long. Involucre of a single reduced bract, shorter than the head. Lowermost glumes sterile and distichous, the fertile upper glumes spirally inserted on the axis; glumes to 5-6 mm. long, naviculate, carinate, the prominent green keel excurrent as a stout mucro. Style trifid, triangular, the angles densely pectinate-ciliate from base to top. Achene to 2.5 mm. long, somewhat stipitate, pyriform-globose or trigonous-globose, white or yellowish, tuberculate. BENI: YACUMA: near Lake Rogagua, 330 m., *Cárdenas* (M. E.) 1395 (GH). LA PAZ: NOR YUNGAS: Milliguaya, 1900 m., *Buchtien* 4177 (GH). TARIJA: ARCE: Padcaya, 2100 m., *Fiebrig* 2553 (GH).

#### 9. BULBOSTYLIS Kunth

Annual or perennial, the slender, often filiform, culms usually caespitose, leafless, glabrous. Leaves filiform, the sheaths ciliate, especially at the orifice, cilia sometimes absent. Inflorescence monocephalous or anthelate, or the spikelets solitary or fasciculate, the scales often puberulent; flowers perfect. Perianth-bristles 0; stamens 2-3; style glabrous, trifid, the base persistent as a tubercle on the achene. Achene trigonous or compressed, smooth, punctulate or undulate-rugose.

a. Inflorescence monocephalous.

b. Inflorescences terminal and basal. .... 1. *B. Funckii*.

- b. Inflorescences terminal only.
  - c. Inflorescence a single obconic spikelet. .... 2. *B. paradoxa*.
  - c. Inflorescence not a single spikelet.
    - d. Achene punctulate but not rugulose. .. 3. *B. sphaerocephala*.
    - d. Achene transversely rugulose. .... 4. *B. juncoides*.
- a. Inflorescence anthelate.
  - e. Leaves and sheaths densely puberulent. .... 6. *B. hirtella*.
  - e. Leaves and sheaths glabrous, but scabrid on the margins.
    - f. Achene punctulate.
      - g. Rhizome present, very short; cilia at sheath-orifice brown. .... 8. *B. junciformis*.
      - g. Rhizome absent; cilia at sheath-orifice white, curling. .... 5. *B. papillosa*.
    - f. Achene transversely rugulose (occasionally quite smooth).
      - h. Spikelets solitary. .... 7. *B. capillaris*.
      - h. Spikelets fascicled (3-5). .... 4. *B. juncoides* var. *ampliceps*.

1. **Bulbostylis Funckii** (Steud.) C. B. Clarke in Kew Bull. Add. Ser. 8: 26 (1908). Annual (?). Culms to 6 cm. high, capillary. Leaves filiform-capillary, shorter than culms, occasionally exceeding the inflorescence; sheath white-ciliate at the orifice. Inflorescence of 2 kinds: terminal solitary spikelets, and basal spikelets. Terminal inflorescence to 4 mm. long, the subtending bract small, usually shorter than the spikelet; scales ovate, somewhat carinate and shortly mucronate; achene less than 1 mm. long, trigonous, transversely rugulose, yellowish-white to very pale brown, the style-base a small flattened brown disc with a minute central apiculus. Basal inflorescence: several flowers enclosed in the bases of modified, rather hyaline leaf-sheaths; achenes about 1.5 mm. long, more markedly rugulose than the terminal achenes. LA PAZ: LARECAJA: Cerro del Iminapi, 2700 m., *Mandon* 1410 (GH).

At first glance this extraordinary little plant may appear to be intermixed with *Isoëtes*, for the basal achene-groups bear a resemblance to the megasporangia of *Isoëtes*.

2. **B. paradoxa** (Spreng.) Lindm. in Bih. Sv. Vet.-Akad. Handl. 26, Afd. 3, no. 9: 17 (1900). Small, densely caespitose perennial from a short woody rhizome. Culms to 1.5 dm. high, but usually shorter. Leaves shorter than the culms, or sometimes nearly equaling them, narrow, obtuse, canaliculate, the base somewhat enlarged, sheath papery, open, densely long-ciliate with white curling hairs. Inflorescence a solitary, terminal, obconic spikelet to 1 cm. long, subtended by several flattened, narrow, long-acuminate bracts, these equaling or shorter than the spikelet; scales lanceolate, the thick green midrib long-excurrent, the basal margins thin, brownish, densely long-ciliate; stamens 2. Achene to 2 mm. long, obovoid, trigonous, the thickened obtuse angles pale, finely rugulose, pale to darkish brown, rather

shining. LA PAZ: CAUPOLICÁN: Altunkama, 2600 m., *Cárdenas* 5679 (US).

3. **B. sphaerocephala** (Boeckl.) C. B. Clarke in Bull. Herb. Boiss. (ser. 2) 3: 1018 (1903). Caespitose perennial from a very short rhizome. Culms to 6 dm. high, rounded below, quadrangular above. Leaves filiform, flexuose, mostly shorter than the inflorescence, but occasionally longer, puberulent, ciliate; sheaths sparsely to copiously long-ciliate or even fimbriate at the orifice. Inflorescence a single more or less globose head of several to numerous spikelets, the heads to 1.2 cm. wide, subtended by 3 conspicuous puberulent involucre bracts (reflexed at maturity), the lowermost to 3 cm. long. Spikelets oblong, acute, to 4-5 mm. long, with 6-7 flowers; scales orbicular to oval, reddish-brown, ciliolate, mucronulate, to 2.5 mm. long; stamens 3. Achene whitish to brownish, obovoid, trigonous, to 0.7 mm. long, finely punctulate, style-base flattened, with a dark center. SANTA CRUZ: SARA: Buenavista, *Steinbach* 6805 (Barros).

3a. **B. sphaerocephala** var. **macrocephala** Kükenth. ex Osten in Anal. Mus. Hist. Nat. Montevideo (ser. 2) 3: 186 (1931). Taller, with a larger head of spikelets. Achene to 0.9 mm. long, grayish, the style-base dark. SANTA CRUZ: SARA: Buenavista, 400 m., *Steinbach* 6806 in part (as to Gray Herbarium sheet).

4. **B. juncooides** (Vahl) Kükenth. ex Osten in Anal. Mus. Hist. Nat. Montevideo (ser. 2) 3: 185 (1931). Annual (?). Culms to 3 dm. tall, caespitose, obscurely quadrangular, scabrid. Leaves filiform-setaceous, scabrid on the veins and margins, shorter than the culms. Inflorescence a single terminal head of relatively few spikelets (up to 8, rarely more), to 1 cm. in diameter but usually narrower, subtended by 3 involucre bracts, the longest exceeding the head, puberulent, the base enlarged, long-ciliate. Spikelets oblong-ovate, to 5 mm. long, with 6-8 flowers; scales dark chestnut-brown, puberulent (at least the lower ones), ciliate, mucronate; stamens 2-3. Achene obovoid, 1 mm. long, trigonous, finely undulate-rugulose, light brown or grayish, the style-base the same color as the achene. LA PAZ: LARECAJA: near Sorata, 2900 m., *Mandon* 1408 (GH).

4a. **B. juncooides** var. **ampliceps** Kükenth. ex Osten in Anal. Mus. Hist. Nat. Montevideo (ser. 2) 3: 188 (1931). *B. sphaerolepis* of the Catalogue. Mostly smaller than the species, the stems smooth, the inflorescence a contracted anthela of 3-5 spikelets sessile and 2 fascicles of 3-5 spikelets terminal on the rays, the involucre bracts mostly glabrous. Spikelets 4-6 mm. long; scales asymmetrical, ciliolate near the apex. Achene pale bluish-gray to whitish. LA PAZ: NOR YUNGAS: Milliguaya, 1100 m., *Buchtien* 4178 (GH); Polo-Polo, 1100 m., *Buchtien* 3649 (GH); SUR YUNGAS: Sirupaya, 2100 m., *Buchtien* 401 (GH). YUNGAS: *Rusby* 67 (GH), *Bang* 306 (GH). SANTA CRUZ: SARA: Buenavista, *Steinbach* 3544 (GH).



5. **B. papillosa** Kükenth. in Fedde, Rep. Sp. Nov. 23: 198 (1926). Annual, caespitose. Culms to 8 dm. tall, basally terete, apically obscurely trigonous, smooth. Leaves very narrowly linear to filiform, to 1.5 mm. wide, shorter than the culms, the margins scabrid; sheath-orifice very long-ciliate with white curling hairs. Inflorescence a terminal anthela with up to 9 rays, subtended by 3-4 involucre bracts mostly shorter than the rays. Spikelets lanceolate, to 6 mm. long, sessile, in dense fascicles of 5-8; scales lance-ovate, dark reddish-brown, mucronate, glabrous or puberulent, to 2 mm. long; stamens 3. Achene oblong-obovoid, 1 mm. long, trigonous, grayish-white, minutely papillate-puncticulate. LA PAZ: SUR YUNGAS: Sirupaya, 2200 m., *Buchtien* 6929 (GH). SANTA CRUZ: CHIQUITOS: El Poston, 506 m., *Cárdenas* 4500 (US).

6. **B. hirtella** (Schrad. ex Schult.) Urb. Symbol. Antill. 2: 166 (1900). Annual. Culms to 4.5 dm. tall, filiform, scabridulous. Leaves much shorter than the culms, filiform-setaceous, shortly pubescent, the sheaths with copious long white ciliation at the orifices. Inflorescence a terminal compound anthela, somewhat compressed, with 4-6 unequal spreading rays, subtended by 2-3 setaceous involucre bracts, the longest exceeding the anthela. Spikelets to 3-4 mm. long, lance-ovate; scales dark red-brown, mucronate or mucronulate, ciliolate, to 1.2 mm. long; stamens 3. Achene to 0.8 mm. long, oblong-obovoid, trigonous, finely puncticulate or somewhat transversely rugulose, the style-base more or less globose. SANTA CRUZ: CORDILLERA: Puerto Suárez, *Etchichury* (Barros).

7. **B. capillaris** (L.) C. B. Clarke in Hook. Fl. Brit. Ind. 6: 652 (1893). Annual, caespitose. Culms to 3.5 dm. high, filiform, glabrous or scabrid. Leaves much shorter than the culms, filiform-setaceous, the margins scabrid, sheath-orifice long-ciliate. Inflorescence anthelate, with 2-5 principal rays, subtended by 2 foliar bracts, the longer usually much exceeding the inflorescence. Spikelets solitary, oblong-ovoid, to 6 mm. long, 6-15-flowered; scales lance-ovate, the upper margins ciliolate, the keel prominent, strongly serrate-scabrid, acute or mucronulate, to 2 mm. long, blackish-brown, finely puberulent; stamens 2 (-3). Achene to 0.8 mm. long, trigonous, obovoid to cordiform, pale brown, slightly or not at all transversely rugulose, the style-base dark. SANTA CRUZ: SARA: Buenavista, *Steinbach* 1913 (GH), 5186 (NY).

7a. **B. capillaris** var. *tenuifolia* (Rudge) C. B. Clarke in Urb. Symbol. Antill. 2: 89 (1900). *B. tenuifolia* of the Catalogue. Plants to 4.5 dm. tall. Involucre bracts shorter than inflorescence. Spikelets narrower (about 1 mm. wide). Achene to 0.9 mm. long, smooth or somewhat transversely rugulose. LA PAZ: LARECAJA: San Carlos, Mapiri, 950 m., *Buchtien* 324 (GH). SANTA CRUZ: SARA: Buenavista, 450 m., *Steinbach* 5201 (NY, US), 6804 (GH), 6989 (GH).

8. *B. junciformis* (HBK.) C. B. Clarke in Trans. Linn. Soc. (ser. 2) 4: 512 (1895). Caespitose, with a very short rhizome. Culms to 8 dm. tall, glabrous. Leaves much shorter than the culms, filiform, smooth or the margins slightly scabridulous, sheath-orifice ciliate with brown hairs. Inflorescence anthelate, compound but condensed, the involucre bracts usually shorter than the inflorescence, not ciliate or only slightly so at the base. Spikelets fasciculate, to 8 mm. long, oblong. Scales ovate, dark brown, minutely puberulent, the midrib somewhat excurrent. Achene obovoid to cuneate, not rugulose but finely punctulate, pale brown to white, the style-base dark. SANTA CRUZ: SARA: Buenavista, 450-500 m., *Steinbach* 1903 (GH), 5185 (GH).

*Bulbostylis boliviana* Palla in Oesterr. Bot. Zeitschr. 59: 191 (1908). I have seen no material of this species, and the original description does not enable me to place it. Consequently, it has been omitted from the key and from the formal treatment of the genus.

#### 10. CLADIUM P. Br.

*Cladium jamaicense* Crantz, Inst. 1: 362 (1766). Perennial, to 1-3 m. tall. Leaves long, to 1 cm. wide, flat, the margins and the midrib beneath scabridulous. Involucre of several bracts, the longest shorter than the inflorescence. Inflorescence to 9 dm. long, paniculate, the numerous spikelets small, red-brown, acute, fasciculate at the ends of the rays. Perianth absent; lowest glumes short, sterile; 1 or 2 above subtending staminate flowers, the terminal flower perfect, its glume to 5 mm. long, acute. Style bifid (or trifid); achene obovoid, the base truncate, apical tubercle not present. SANTA CRUZ: SARA: Cerro de Amboró, 1000 m., *Steinbach* 3007 (GH).

#### 11. RHYNCHOSPORA Vahl (nomen conservandum) (including *Dichromena* and *Pleurostachys*)

See Kükenthal in Bot. Jahrb. 74: 375-509 (1949); 75: 90-195 (1950), 273-314 (1951), 451-484 (1952).

Perennial from rhizomes. Culms mostly triangular and leaf-bearing. Leaves long-sheathing, flat, sometimes subplicate. Inflorescence paniculate, composed of smaller panicles or corymbs, or often reduced to 1-3 rather dense glomerulate heads. Spikelets with the lowermost scales empty, the middle scales subtending perfect flowers, the uppermost bearing staminate or sterile flowers. Perianth present as scabridulous or smooth hypogynous bristles, or absent; stamens 2-3; style long, shortly or deeply bifid, the base persistent on the achene. Achene orbicular, obovoid, ovoid or oblong, biconvex, transversely rugulose, or finely cancellate, or scrobiculate, or smooth, usually shining.

- a. Culms monocephalous.
  - b. Bracts foliar, long, much exceeding the heads.
    - c. Style-base bluntly triangular, not basally lobed. .... 22. *R. nervosa*.
    - c. Style-base flattened, 2-lobed basally, the lobes decurrent on the achene. .... 23. *R. radicans*.
  - b. Bracts not foliar, short, not equaling the heads.
    - d. Bristles 3, not at all plumose. .... 12. *R. hirta*.
    - d. Bristles 2-5, plumose on lower half. .... 11. *R. globosa*.
- a. Culms not monocephalous.
  - e. Bristles present.
    - f. Bristles not plumose.
      - g. Achene pitted, scrobiculate or cancellate, but not transversely rugulose.
        - h. Achene pitted or scrobiculate.
          - i. Spikelet many-flowered.
            - j. Leaf-blade to 2 cm. wide, the base petiolately attenuate. .... 1. *R. umbraticola* var. *Kuntzei*.
            - j. Leaf-blade filiform, to 1 mm. wide, the base not attenuate. .... 20. *R. confinis*.
          - i. Spikelet 2-3-flowered. .... 6. *R. corymbosa*.
        - h. Achene cancellate.
          - k. Spikelet 5-6-flowered. .... 5. *R. polyphylla*.
          - k. Spikelet 2-3-flowered.
            - l. Rachilla strongly curved between spikelets. .... 4. *R. aristata*.
            - l. Rachilla straight or nearly so, but not strongly curved between spikelets.
              - m. Achene to 1.5 mm. long, very minutely cancellate. .... 2. *R. macrochaeta*.
              - m. Achene to 2 mm. long, obviously cancellate. .... 3. *R. Schiedeana*.
    - g. Achene transversely rugulose.
      - n. Inflorescence of a few dense heads; style only slightly bifid. .... 7. *R. cyperoides*.
      - n. Inflorescence of distant corymbs; style deeply bifid.
        - o. Style-base conic-subulate, as long and broad as the achene. .... 13. *R. Marisculus*.
        - o. Style-base conic, as wide as the achene but only half as long. .... 14. *R. glauca*.
  - f. Bristles plumose, at least in part.
    - p. Inflorescence of 5-6 lax distant corymbs. .... 24. *R. millegrana*.
    - p. Inflorescence of 7-12 distant pyramidal panicles. .... 25. *R. puberula*.
- e. Bristles 0.
  - q. Achene horned at shoulders, appearing tridentate. ....

- ..... 21. *R. setacea*.
- q. Achene not horned at shoulders, not appearing tridentate.
- r. Achene gray.
- s. Achene hardly or not at all rugulose. .... 9. *R. andina*.
- s. Achene obviously rugulose. .... 19. *R. emaciata*.
- r. Achene brownish to blackish.
- t. Achene not transversely rugulose, but cancellate or scrobiculate.
- u. Spikelets fasciculate; achene scrobiculate; style-base depressed, much shorter and narrower than achene. .... 20. *R. confinis*.
- u. Spikelets solitary; achene cancellate; style-base conic-subulate, longer than and nearly as wide as achene. .... 10. *R. boliviensis*.
- t. Achene transversely rugulose.
- v. Leaf-blades to 1.4 cm. wide; panicle of relatively few dense heads. .... 8. *R. exaltata*.
- v. Leaf-blades to 2-3 mm. wide; inflorescence not of dense heads.
- w. Spikelets solitary or paired at ends of peduncles. .... 16. *R. velutina* var. *Sellowiana*.
- w. Spikelets fasciculate.
- x. Lowest scales (3-4) more or less long-apiculate, the apiculus hirtellous. .... 15. *R. robusta*.
- x. Lowest scales not long-apiculate, not hirtellous.
- y. Inflorescence of 2-3 remote lax corymbs. .... 18. *R. tenuis*.
- y. Inflorescence of 2-3 remote lax pyramidal panicles. .... 17. *R. luzuliformis*.

1. **Rhynchospora umbraticola** var. **Kuntzei** (C. B. Clarke) Kükenth. in Bot. Jahrb. 74: 391 (1949). *Dichromena Kuntzei* of the Catalogue. Culms to 4 dm. tall. Leaves mostly basal, the blades to 3 dm. long (occasionally to 5 dm.) and 2 cm. wide, glabrous, the bases subpetiolately attenuate. Inflorescences axillary and terminal, corymbose-paniculate; bracts foliar, usually exceeding the inflorescences. Spikelets solitary, oblong-elliptic, to 7 mm. long, with numerous (12-20) flowers; scales light brown, ovate, mucronate; bristles 6, antrorsely scabridulous, exceeding the achene; stamens 3; style shortly bifid, the style-base as long and broad as the achene. Achene to 3 mm. long, obovate, shining, brown, biconvex, densely and evenly scrobiculate. SANTA CRUZ: CERCADO: Cerro Amboró, *Steinbach* 3459 (GH); SARA: Río Yapacani, *O. Kuntze* (type; photo, GH); Buenavista, 450 m., *Steinbach* 2878 (GH). BENI: YACUMA: Rurrenabaque, *Cárdenas* (M. E.) 1586 (GH, NY), *White* (M. E.) 851 (GH, US).

2. **R. macrochaeta** Steud. ex Boeckl. in *Linnaea*, 38: 632 (1874).

Culms to nearly 1 m. tall, with up to 3 cauline leaves. Leaves shorter than culms, to 6 mm. wide, glabrous, the revolute margins scabrid. Inflorescence of terminal and axillary, short, pyramidal or subpyramidal panicles, the terminal panicle larger and denser than the laterals; bracts foliar, exceeding the panicles. Spikelets linear to narrowly lanceolate, to 6-7 mm. long, solitary or paired, few-flowered (2-3); scales lance-oblong, membranous, brown or red-brown; bristles 4-6, antrorsely scabrid, slightly exceeding the achene; stamens 3; style apically subentire or somewhat bifid, the style-base pyramidal, rugose, as long and broad as the achene. Achene to 1.5 mm. long, brown to blackish, shining, minutely cancellate. COCHABAMBA: CERCADO: Cochabamba, *Bang* 1071 (GH); CHAPARE: Locotal, 1600m., *Steinbach* 9096 (GH).

2a. *R. macrochaeta* var. *Ruiziana* (Boeckl.) Kükenth. in Bot. Jahrb. 74: 393 (1949). Components of inflorescence longer (to 9 cm.), spikelets 2-4-flowered, scales with the midrib excurrent as a long mucro. LA PAZ: NOR YUNGAS: Polo-Polo, 3200 m., *Buchtien* 698 (GH); LARECAJA: Ingenio del Oro, *Rusby* 167 (GH). SANTA CRUZ: VALLEGRANDE: Comarapa, 2800 m., *Steinbach* 8340 (GH, NY); Cerro San Mateo, Comarapa, 3500 m., *Steinbach* 8532 (GH, NY).

*Rhynchospora macrochaeta* var. *colombiensis* f. *condensata* and *R. macrochaeta* var. *quinespicata*, listed in the Catalogue, seem hardly worthy of recognition.

3. *R. Schiedeana* (Schlechtd.) Kunth, Enum. Pl. 2: 300 (1837). Culms to 1.5 m. high, glabrous. Leaves basal and cauline, very long, mostly exceeding the inflorescence, acuminate, to 1 cm. wide, the margins scabrid. Inflorescence paniculate, compound, interrupted, the component panicles pyramidal or subpyramidal. Spikelets solitary or paired, lanceolate, to 6-7 mm. long, 2-3-flowered; scales 5-6, red-brown, lance-ovate, mucronate; bristles 3-4, antrorsely scabrid, shorter than the achene; stamens 3; style entire or the apex very briefly bifid, the style-base conic-subulate, blackish, rugose, as long and broad as the achene. Achene much shorter than the scales, about 2 mm. long, broadly obovoid, shiny brown, cancellate. LA PAZ: NOR YUNGAS: Unduavi, 3200 m., *Buchtien* 2588 (GH), 2593 (GH), SUR YUNGAS: San Felipe, *Holway & Holway* (GH, NY).

4. *R. aristata* Boeckl. in Flora, 40: 36 (1857). *R. aristata* var. *latilaminata* Kükenth. in Fedde, Rep. Sp. Nov. 26: 253 (1929). Culms to 9 dm. (-1.5 m.) high, glabrous. Leaves mostly basal (about 3 cauline), equaling the inflorescence, to 8(-20) mm. wide, glabrous, scabridulous near the apex. Inflorescence a lax, open, compound panicle, the terminal portion corymbose, the laterals pyramidal, branches divaricate; bracts foliar, exceeding the panicle, bractlets setaceous, basally ciliate. Spikelets solitary, distant, the rachilla

strongly curved between spikelets, 6-9 mm. long, 2-3-flowered, the lowermost flower perfect, the rest staminate or sterile; scales 6-7, brown or reddish-brown, mucronate or aristate; bristles 4-5, antrorsely scabrid, shorter or longer than the achene; stamens 3; style long, shortly bifid, the style-base ashy-gray, conic-subulate, longer and much narrower than the achene. Achene about 2 mm. long, broadly ovoid, shiny brown or stramineous, cancellate. LA PAZ: NOR YUNGAS: Polo-Polo, 1100 m., *Buchtien* 3651 (GH; type-number of var. *latilaminata*). COCHABAMBA: CHAPARE: Locotal, 1600 m., *Steinbach* 9100 (GH).

The variety *latilaminata* was recognized primarily on the basis of broader leaves (2 cm. wide), but an isotype available to me has leaves rather less than 1 cm. wide. Its separateness seems dubious.

5. **R. polyphylla** Vahl, Enum. 2: 230 (1806). Culms to 9 dm. high, basally thickened, glabrous. Leaves increasing in size upwards on the culm, exceeding the inflorescence, to 1 cm. wide, glabrous or more or less pilose. Inflorescence a long, lax, compound, pale panicle, the 4-7 components distant, much-branched, more or less pyramidal; bracts foliar, exceeding the component panicles. Spikelets solitary, or occasionally 2-3 in a fascicle, 5-6-flowered, terete or lanceolate, 4-5 mm. long, distant on the produced rachilla; scales light-stramineous, lance-ovate, mucronate; bristles few, minute (rarely 1 or more exceeding the achene); stamens 2-3; style long, entire or slightly bifid, style-base pyramidal, greenish, as wide as the achene, but about half its length. Achene obovoid, slightly less than 1 mm. long, biconvex, cancellate, light brown. LA PAZ: LARECAJA: San Carlos, Mapiri, 850 m., *Buchtien* 341 (Kükenthal).

5a. **R. polyphylla** var. **laxa** (Beauv.) Pfeiff. in Fedde, Rep. Sp. Nov. 49: 78 (1940). *Dichromena Mandonii* of the Catalogue. Culms taller, to 1.4 m., leaves broader (to 2 cm.), component-panicles 3-4, scales rusty-brown, bristles 4, exceeding the achene. LA PAZ: LARECAJA: Sorata, *Mandon* 1421 (Kükenthal).

5b. **R. polyphylla** var. **longispiculosa** Kükenth. in Bot. Jahrb. 74: 406 (1949). Components of the panicle 3, approximate, spikelets dull brown, linear-subulate, to 9-10 mm. long. SANTA CRUZ: SARA: La Perdix, 450 m., *Steinbach* 7993 (GH).

6. **R. corymbosa** (L.) Britton in Trans. N. Y. Acad. Sci. 11: 84 (1892). Culms to 1 m. high, glabrous, the cauline leaves inserted remotely. Leaves equaling or shorter than the culms, to 2 cm. wide, the midrib and margins scabrid. Inflorescence a panicle of 2-5 distant corymbs; bracts long, foliar. Spikelets many, usually fasciculate (2-5 in a fascicle), occasionally solitary, 6-8 mm. long, 2-3-flowered; scales red-brown, mucronate; bristles 6, antrorsely scabrid, exceeding the

achene; stamens 3; style nearly entire, the conic base as wide and long as the achene, brownish, basally bilobed, sometimes finely puberulent. Achene obovoid, 2-3 mm. long, brown or chestnut-brown, the 2 broad faces with irregular depressions, densely and finely pitted. SANTA CRUZ: SARA: Buenavista, *Steinbach* 6674 and 7051 (Kükenth. 5215 (GH, NY). BENI: YACUMA: Reyes, 300 m., *White* (M. E.) 1527 (GH, NY); near Lake Rogagua, 300 m., *Rusby* (M. E.) 1642 (GH, NY).

7. *R. cyperoides* (Swartz) Mart. in Denkschr. Akad. Wiss. Münch. 6: 149 (1820). Culms solitary, to 1 m. tall, scabrid on the angles, with 2-3 distant cauline leaves. Leaves shorter than the culms, to 7 mm. wide, the margins scabrid. Inflorescence a panicle of a few, dense, distant, globose heads (anthelate), bracts mostly exceeding the heads. Spikelets to 6 mm. long, ovate-lanceolate, many in a head; scales 7-8, mucronate, pale red-brown; bristles 6, antrorsely scabrid, 3 or 0 in male flowers; stamens 3; style slightly bifid, the base pale green, longer and much narrower than the achene, conic-subulate. Achene about 1.5 mm. long, shorter than the scale, obovoid, brown, shining, the margins slightly scabrid, finely transverse-rugulose. SANTA CRUZ: CERCADO: Santa Cruz, *Steinbach* 5343 (NY).

8. *R. exaltata* Kunth, Enum. Pl. 2: 291 (1837). *R. exaltata* var. *ovalis* of the Catalogue. Culms to 1 m. or more. Leaves as long as the culms or shorter, to 1.4 cm. wide, the margins and nerves scabrid or serrulate-scabrid. Inflorescence a much-interrupted panicle of rather dense heads; bracts exceeding the heads. Spikelets more or less stellately arranged in the heads, to 6 mm. long, narrowly lanceolate to subulate; scales stramineous or pale brown, mucronate; bristles 0; stamens 3; style with 2 linear branches, the style-base subulate, ashy-gray, shorter than the achene. Achene to 2.5 mm. long, orbiculate to ovoid, chestnut-brown, shining, transversely rugulose. LA PAZ: LARECAJA: San Carlos, Mapiri. 850 m., *Buchtien* 339 (GH).

8a. *R. exaltata* var. *cephalophora* (Nees) Kükenth. in Bot. Jahrb. 74: 440 (1949). Inflorescence racemose, of solitary, distant spikes. Bristles present (2-3). SANTA CRUZ: [prov. uncertain]: Cerro Hosana, *Steinbach* 3387 (Kükenth.).

9. *R. andina* Kükenth. in Fedde, Rep. Sp. Nov. 53; 73 (1944). Culms to 3.5 dm. tall, glabrous, cauline leaves absent or 1, culms clothed basally in fibrous remains of old leaf-sheaths. Leaves much shorter than the culms, to 1 mm. wide, glabrous. Inflorescence a panicle of 2-4 distant corymbs, bracts shorter than or equaling the peduncles. Spikelets few, fasciculate, rarely solitary, to 4 mm. long, lance-oblong; scales 7-8, brown, midrib excurrent as an arista; bristles 0; stamens 3; style entire, the flattened base brownish, as broad as, but shorter than, the achene. Achene to 1 mm. long, obovoid, shining, gray,

obscurely or not at all transversely rugulose. LA PAZ: LARECAJA: Hacienda Casana, 1400-1600 m., *Buchtien* 7159 (GH; type-number).

10. *R. boliviensis* C. B. Clarke in Kew Bull. Add. Ser. 8: 37 (1908). Culms to 2-3.5 dm. high. Leaves to 15 cm. long and 1-2 mm. wide, flat, glabrous. Inflorescence a lax slender panicle to 15 cm. long, spikelets solitary, pedicellate, 10-20 on a culm. Spikelets 5 mm. long, oblong-lanceolate; scales lanceolate to ovate, not mucronate, brown, the lowest 4 sterile; bristles 0; style very shortly bifid, style-bases basally inconspicuously bilobed, conic-subulate, 1.5 mm. long and nearly as wide as the achene. Achene 1 (-1.25) mm. long, obovoid, plano-convex, abruptly narrowed at the apex into an extremely short neck, brownish, cancellate. YUNGAS: 2000 m., *Rusby* 83 (NY; type-number). LA PAZ: NOR YUNGAS: Unduavi, 3300 m., *Rusby* 82 (NY), 85 (US).

11. *R. globosa* (HBK.) Roem. & Schult. Syst. Veg. 2: 89 (1817). *R. globosa* var. *Loefgrenii* of the Catalogue. Culms to 9 dm. high, caespitose, glabrous, cauline leaves 0. Leaves shorter than culms, to 2 mm. wide, margins scabrid, grayish-green. Inflorescence monocephalous, the globose head to 1-2 cm. in diameter, bracts short, scale-like, not foliar, inconspicuous, firm-textured, brownish, mucronate, the margin ciliate on the upper portion. Spikelets 6-7 mm. long, lanceolate; scales reddish-brown, the lowest short, the upper longer, acute; bristles 5 in perfect flowers, usually 2 in staminate flowers, the basal portion densely white-plumose, the apical portion antrorsely scabrid; stamens 3; style very briefly bifid, the conical base light greenish-brown, narrower and shorter than the achene. Achene about 2 mm. long, oblong-obovoid, brown, the shoulders scabrid-ciliate at the apex. BENI: YACUMA: near Lake Rogagua, 330 m., *Rusby* (M. E.) 1700 (GH). LA PAZ: NOR YUNGAS: Milliguaya, 1800 m., *Buchtien* 4154 (GH). COCHABAMBA: CERCADO: near Cochabamba, *Bang* 873 (GH). SANTA CRUZ: SARA: Buenavista, 500 m., *Steinbach* 5351 (GH); Dolores, 450 m., *Steinbach* 1896 (GH); CHIQUITOS: 5 km. north of Santiago de Chiquitos, 700 m., *Cutler* 7020 (GH).

The heads of the last collection cited are described by the collector as lemon-yellow.

12. *R. hirta* (Nees) Boeckl. in Vidensk. Meddel. Kjoebenh. 1869: 146 (1870). Culms solitary, to 6.5 dm. long, glabrous or somewhat pilose. Leaves shorter than the culms, to 5 mm. wide, the lower portion pilose-ciliate. Inflorescence monocephalous, the hemispherical to globose head to 2 cm. in diameter; bracts numerous, imbricate, ovate, acuminate, light brown, the margins entirely long-ciliate. Spikelets to 6-7 mm. long, lanceolate; scales 6, lance-oblong, pale brown; bristles 3, unequal, 1 exceeding, 2 shorter than, the achene, antrorsely scabrid, but not plumose; stamens 3; style hardly bifid,



the long-conic greenish-brown base half as long as and narrower than the achene. Achene 2 mm. long, oblong, concavo-convex, brown, finely punctulate, apically papillose. SANTA CRUZ: eastern Velasco, *O. Kuntze* (Kükenthal).

13. *R. Marisculus* Lindl. & Nees in Mart. Fl. Bras. 2(1): 142 (1842). Rhizome occasionally shortly stoloniferous. Culms to 1.5 m. high, smooth, with 4-5 distant cauline leaves. Basal leaves long, shorter than the culms, to 7 mm. wide, the margins scabrid. Inflorescence a panicle of 2-3 distant corymbs, the bracts shorter than the peduncles. Spikelets oblong-lanceolate, to 6-7 mm. long; scales 6, reddish-brown, lanceolate, mucronate; bristles 6, exceeding the achene, antrorsely scabrid; stamens 3; style deeply bifid, the conic-subulate base ashy-gray, as long and as broad as the achene. Achene 1.5 mm. long, obovoid, rather shiny, transversely rugulose. Without data: *Bang* 2204 (GH).

14. *R. glauca* Vahl, Enum. 2: 233 (1806). Culms slender, to 7.5 dm. tall, with 3 distant cauline leaves. Leaves shorter than the culms, to 3 mm. wide, the margins scabrid. Inflorescence a small terminal panicle of 3-4 distant corymbs; bracts narrow, about equaling the corymbs. Spikelets few, more or less fasciculate, 3-4 mm. long, lanceolate; scales ovate, dark brown, shortly mucronate; bristles 6, of varying lengths but mostly equaling the achene, antrorsely scabrid; stamens 3; style deeply bifid, the conical base gray, as wide as the achene and up to half as long. Achene suborbicular to obovoid, yellowish-brown, shiny, to 2 mm. long, transversely undulate-rugose. YUNGAS: *Bang* 433 (GH). LA PAZ: LARECAJA: Guanai-Tipuani, *Bang* 1426 (Kükenthal); Hacienda Simaco, 1400 m., *Buchtien* 5360 (GH).

15. *R. robusta* (Kunth) Boeckl. in Linnaea, 37: 616 (1873). Stoloniferous. Culms to 1.2 m. high, glabrous, smooth. Leaves firm, to 8 mm. wide, long, glabrous or ciliate. Inflorescence of 2-3 distant terminal corymbs; bract foliar, pilose. Spikelets solitary or fasciculate, to 1 cm. long, oblong-ovate; scales ovate to ovate-oblong, the lower with the midrib prolonged as a conspicuous hirtellous apiculus; bristles 0; stamens 3; style bifid, the base campanulate to bilobed, decurrent on the achene. Achene orbicular, to 1.5 mm. long, brown, undulate-rugose. BENI: YACUMA: near Lake Rogagua, 300 m., *Rusby* (M. E.) 1425 (GH, NY), 1442 (NY, US). SANTA CRUZ: SARA: Río Cuchi, 450 m., *Steinbach* 6619 (GH).

This species was not ascribed to Bolivia by Kükenthal. Although the material cited is young, there seem to be no perianth-bristles present. The hirtellous apiculus of the lowest scales is quite obvious, and I cannot attribute the specimens to any other species known from Bolivia.

16. *R. velutina* var. *Sellowiana* (Kunth) Boeckl. in *Linnaea*, 37: 614 (1873). Culms to 9 dm. high, with 3-5 cauline leaves. Leaves shorter than the inflorescence, glabrous, 2-3 mm. wide, margins scabrid. Inflorescence of 1 terminal and 2 lateral corymbs; bracts 3, foliar. Spikelets solitary or paired at ends of peduncles, oblong-cylindrical, 5-6 mm. long; scales lance-ovate, the uppermost mucronate, brown or reddish-brown; bristles 0; stamens 3; style bifid, the campanulate base broadly bilobed at its base. Achene obovoid to orbicular, 2 mm. long, margined, chestnut-brown, shiny, transversely rugose. SANTA CRUZ: SARA: Buenavista, *Steinbach* (Kükenthal).

17. *R. luzuliformis* Boeckl. in *Linnaea*, 37: 632 (1873). Rhizome elongate, producing scaly stolons. Culms to 3 dm. high, glabrous, not scabrid, with 2-3 distant cauline leaves. Leaves equaling the culms, to 2 mm. wide, the margins scabrid. Inflorescence a compound panicle of 2-3 remote, smaller, more or less pyramidal panicles; bracts long, linear, foliar, much exceeding the component panicles. Spikelets somewhat fasciculate, 3 mm. long, oblong-ovate, reddish or brown; scales densely imbricate, ovate to oblong-ovate, mucronate; bristles 0; stamens 3; style bifid, the base pyramidal, gray-green, decurrent on the shoulders of the achene, as broad and half as long as the achene. Achene subglobose, lenticular or biconvex, yellow-brown, transversely undulate-rugose. TARIJA: ARCE: Camacho, 2500 m., *Fiebrig* 2575 (GH).

18. *R. tenuis* Link in Spreng. Schrad. & Link, *Jahrb.* 1(3): 76 (1820). Rhizome very short or lacking. Culms to 4 dm. high, filiform, smooth and glabrous, with 1-2 cauline leaves. Leaves shorter than the culms, to 2 mm. wide, glabrous. Inflorescence of 2-3 lax remote corymbs; bracts almost filiform. Spikelets usually fasciculate (2-3), 4-5 mm. long; scales 5-6, red-brown or stramineous, ovate to ovate-lanceolate, mucronate; bristles 0; stamens 3; style bifid, the base flattened-pyramidal, gray to blackish, its base bilobed, decurrent on the angles of the achene, half as long as the achene. Achene 1 mm. long, orbicular to obovoid, reddish-brown to blackish, conspicuously transverse-rugose. SANTA CRUZ: SARA: Buenavista, 500 m., *Steinbach* 5056 (GH, NY), 5060 (GH, NY).

19. *R. emaciata* (Nees) Boeckl. in *Vidensk. Meddel. Kjöbenhavn.* 1869: 149 (1870). *R. tenuis* var. *emaciata* of the Catalogue. Culms to 6 dm. tall, trigonous, smooth and glabrous. Leaves very much shorter than the culms, filiform, canaliculate. Inflorescence terminal, of 1-2 remote lax corymbs; bracts long, bracteoles long-setaceous. Spikelets solitary, pedicellate, lance-oblong, 5-6 mm. long; scales 5-6, brownish with hyaline margins, aristate; bristles 0; stamens 3; style deeply bifid, the depressed-pyramidal base about one-third the length of the achene and much narrower, stramineous to castaneous, its base almost entire

and not decurrent on the achene. Achene 1 mm. long, orbicular, lead-gray, undulate-rugose. SANTA CRUZ: SARA: Buenavista, 450 m., *Steinbach* 1899 (GH), 6926 (GH).

20. *R. confinis* (Nees) C. B. Clarke in Kew Bull. Add. Ser. 8: 40, 119 (1908). Rhizome long. Culms solitary, to 5 dm. tall, smooth, with remote cauline leaves to 1 mm. wide, shorter than the culms, scabrid. Inflorescence 2-3 dense long-pedunculate corymbs; bracts setaceous, exceeding the corymbs. Spikelets rather densely fasciculate, to 8 mm. long, many-flowered; scales oblong-lanceolate, aristate, reddish-brown; bristles usually 0, occasionally 3; stamens 3; style deeply bifid, the blackish base depressed-campanulate, narrower than the achene. Achene 1 mm. long, broadly obovoid, pale to chestnut-brown, finely scrobiculate. SANTA CRUZ: SARA: Buenavista, 450 m., *Steinbach* 6924 (GH), 7091 bis (GH).

21. *R. setacea* (Berg.) Boeckl. in Vidensk. Meddel. Kjoebenh. 1869: 159 (1870). *R. tenerrima* of Catalogue. Caespitose, the bases of tufts somewhat enlarged, rhizome absent. Culms to 3.5 dm. high, filiform, smooth. Leaves mostly longer than culms, sometimes shorter, filiform, glabrous. Inflorescence of 2-4 axillary and terminal, somewhat lax, distant corymbs with 1-6 spikelets in each; bracts setaceous, exceeding the corymbs. Spikelets in small fascicles or solitary, 4-5 mm. long, lanceolate to terete; scales 7-8, ovate to lanceolate, firm, stramineous to reddish, with the midrib prolonged as an arista; bristles 0; stamens 2; style bifid, the base broad, flat, elongated as 2 horns at the shoulders of the achene, the achene thus appearing tridentate. Achene 1 mm. long, orbicular, brown, transversely undulate-rugose. SANTA CRUZ: SARA: Buenavista, *Steinbach* 1901 (GH).

22. *R. nervosa* (Vahl) Boeckl. in Vidensk. Meddel. Kjoebenh. 1869: 143 (1870). *Dichromena ciliata* of the Catalogue. Rhizome short, often developing woody stolons. Culms to 7 dm. high, usually shorter, usually glabrous. Leaves as long as the culms or shorter, 1-2 mm. wide, basally sheathing, the old sheaths reduced to a basal collar of fibers, blades scabrid-ciliate. Inflorescence a single terminal head of 3-5 spikelets 6-8 mm. long; involucre of 4-7 unequal bracts, the bracts pubescent on the abaxial side and at least the basal portion ciliate. Scales oblong-ovate to lance-ovate, the midrib thickened, glabrous, white; bristles 0; stamens 3; style deeply bifid, the style-base bluntly pyramidal. Achene to 1.5 mm. long, orbicular to obovoid, or more or less lenticular, dark brown, transversely rugulose. YUNGAS: *Bang* 251 (GH). BENI: CERCADO MOJOS: Trinidad-Misiones Guarayos, 250 m., *Werdermann* 2487 (MO); YACUMA: Reyes, *White* (M. E.) 1537 (GH). LA PAZ: NOR YUNGAS: Milluguaya, 1900 m., *Buchtien* 396 (GH); Polo-Polo, 1100 m., *Buchtien* (GH). SANTA CRUZ: SARA: Buenavista, 450 m., *Steinbach* 3277 (GH), 6725 (GH).

The binomial *Rhynchospora ciliata* (Vahl) Kükenth. (based on *Dichromena ciliata* Vahl) is a later homonym of *R. ciliata* Vahl and therefore cannot be used for this species.

22a. *R. nervosa* var. *Jelskiana* (Boeckl.) Kükenth. in Bot. Jahrb. 75: 298 (1952). Differs in having wider leaves (3-4 mm.), the culms often pilose, and spikelets to 12 mm. long. SANTA CRUZ: SARA: Río Surutú, *Steinbach* 6841 bis (Kükenthal).

24. *R. millegrana* (Nees) R. C. Foster, comb. nov. *Nemochloa millegrana* Nees in Mart. Fl. Bras. 2(1): 148 (1842). Rhizome slender, scaly, horizontal. Culms to 1.2 m. high, smooth. Leaves long, but usually shorter than the culms, 5-7 mm. wide, the margins and nerves scabrid. Inflorescence of terminal and lateral distant lax corymbs; bracteoles narrow, setaceous. Spikelets to 2 mm. long, solitary or 2-3 approximate; scales broadly ovate, often emarginate, coppery or pale red-brown; bristles 4-5, plumose; stamens 3; style deeply bifid, the base conic-pyramidal, ashy gray, less than half the length of the achene. Achene to 1.5 mm. long, orbicular-obovoid, shiny, deep chestnut-brown, granulate-rugulose. LA PAZ: LARECAJA: San Carlos, Mapiri, 850 m., *Buchtien* 332 (GH); San Antonio, Mapiri, 850 m., *Buchtien* 1233 (GH).

This is the variant which has been distinguished as *Pleurostachys minuscula* Kükenth. in Fedde, Rep. Sp. Nov. 26: 254 (1929).

According to the Index Kewensis, the binomial *Rhynchospora millegrana* has been published before, being attributed to Schrad. ex Steud. Syn. Pl. Cyp. 139 (1855). Examination of this citation shows that the binomial was published in synonymy, so that the name cannot serve as a bar to the proper transfer of the basionym.

25. *R. puberula* (Boeckl.) L. B. Smith in Phytologia, 1: 82 (1934). *Pleurostachys puberula* var. *Buchtienii* of the Catalogue. Rhizome short, thick. Culms to 1.2 m. tall, thick. Leaves about equaling the culms, to 2 cm. wide, pilose or glabrate beneath, the sheaths puberulent. Inflorescence of 7-12 distant pyramidal panicles; bracts exceeding the panicles. Spikelets more or less globose, to 1.5 mm. long, in dense spikes at ends of branchlets; scales broadly ovate, reddish-brown; bristles 4-5, plumose, at least in part; stamens 3; style-base conic-pyramidal, much shorter than the achene. Achene 1 mm. long, obovoid, shiny chestnut-brown, densely granulate-rugose. LA PAZ: LARECAJA: San Carlos, Mapiri, 850 m., *Buchtien* 336 and 337 (Kükenthal).

## 12. CALYPTROCARYA Nees

**Calyptracarya glomerulata** (Brongn.) Urb. Symbol. Antill. 2: 169 (1900). *Becquerelia glomerulata* and *Calyptracarya fragifera* of the Catalogue. Perennial from a slender woody rhizome, to 3.5 dm. high, the entire plant glabrous. Leaves eligulate, linear, to 9 mm. wide, usually exceeding the inflorescence. Inflorescence of small terminal or axillary corymbose panicles, the individual subglobose heads to 3 mm. long, the flowers unisexual. Female flowers: 2 distichous basal glumes or scales, many-nerved, the mid-nerve very prominent; achene lenticular to biconvex, apiculate, covered by a puberulent membrane, about 1 mm. long; style bifid. Male spikelets 2-4 at base of pistillate flowers, each of 1-4 flowers reduced to single stamens. SANTA CRUZ: ICHILO: Río Vibora, 350 m., *Steinbach* 7579 (GH).

## 13. SCLERIA Berg.

See Core in *Brittonia*, 2: 1-105 (1936).

Perennial, rhizomatous or stoloniferous (1 species sometimes annual, with fibrous roots). Culms mostly triangular. Leaf-sheaths often triolate, ligulate; blades sometimes plicate. Inflorescence of distant glomerulate heads, or densely spicate, or obviously paniculate, or, in no. 1, of dense heads subsessile in the leaf-axils. Flowers unisexual, perianth absent. Pistillate spikelets 1-flowered, often in the axil of the lowest sterile scale of a staminate spikelet. Staminate spikelets few-to many-flowered. Hypogynium obscure or absent in a few species, but present in most. Achenes hard, bony, often smooth and shining, or reticulate, rugose, verrucose or tuberculate.

- a. Inflorescence of dense spikelet-heads subsessile in leaf-axils. .... 1. *S. amphigaea*.
- a. Inflorescence not of dense spikelet-heads subsessile in leaf-axils.
  - b. Achenes smooth and glabrous.
    - c. Hypogynium obscure or absent.
      - d. Inflorescence simple, the spikelets in distant glomerulate heads.
        - e. Scales hirsute. .... 2. *S. hirtella*.
        - e. Scales glabrous. .... 3. *S. leptostachya*.
      - d. Inflorescence branched.
        - f. Achenes 2-2.5 mm. long. .... 4. *S. lithosperma*.
        - f. Achenes 1.5-2 mm. long. .... 5. *S. castanea*.
    - c. Hypogynium obviously present.
      - g. Margin of hypogynium entire or undulate, not 3-lobed.
        - h. Achenes 3.5-6 mm. long. .... 7. *S. macrophylla*.
        - h. Achenes 3 mm. or less in length.
          - i. Hypogynium long-ciliate on margin. .... 9. *S. mitis*.
          - i. Hypogynium short-ciliolate on margin.
            - j. Largest achenes 2 mm. long. .... 8. *S. microcarpa*.

- j. Largest achenes 3 mm. long. .... 10. *S. obtusa*.
- g. Margin of hypogynium 3-lobed.
  - k. Margin obscurely 3-lobed. .... 19. *S. vaginata*.
  - k. Margin obviously 3-lobed.
    - l. Lobes fimbriate.
      - m. Inflorescence and achenes purplish. .... 12. *S. arundinacea*.
      - m. Inflorescence brown; achenes white. .. 13. *S. latifolia*.
    - l. Lobes entire.
      - n. Inflorescence purple or brownish-purple. .... 20. *S. melaleuca*.
      - n. Inflorescence green or yellow-brown. .... 21. *S. pterota*.
- b. Achenes not smooth and glabrous.
  - o. Hypogynium obscure or none.
    - p. Inflorescence of few, distant, glomerulate heads. .... 3. *S. leptostachya*.
    - p. Inflorescence dense, spicate. .... 6. *S. composita*.
  - o. Hypogynium obviously present.
    - q. Hypogynium subentire, the margin undulate. .. 22. *S. secans*.
    - q. Hypogynium 3-lobed.
      - r. Plant scandent. .... 17. *S. tenacissima*.
      - r. Plant not scandent.
        - s. Achenes reticulate.
          - t. Achenes faintly reticulate, sparsely puberulent, 2-3 mm. long. .... 18. *S. lagoënsis*.
          - t. Achenes reticulate, the ridges pubescent, 2 mm. long. .... 16. *S. setacea*.
        - s. Achenes rugose, verrucose or tuberculate.
          - u. Staminate and pistillate spikelets in separate parts of inflorescence. .... 15. *S. bracteata*.
          - u. Staminate and pistillate spikelets not in separate parts of inflorescence.
            - v. Achenes minutely verrucose. .... 11. *S. cyperinoides*.
            - v. Achenes rugose-tuberculate. .... 14. *S. panicoides*.

1. ***Scleria amphigaea*** Raymond in Nat. Canad. 91: 132 (1964). *Diplacrum longifolium* of the Catalogue. Perennial, with creeping scaly stolons, plants to 0.5 m. high. Stems leafy, leaves linear, to 5 mm. wide, glabrous, bearing dense, globular, sessile heads of spikelets in the axils. Trifid style and achene subtended by 2 broad scales to 4-5 mm. long, flanked by 2 staminate spikelets, the staminate flowers monandrous, usually 6 to a spikelet, subtended by 2 narrow scales. Fruit suborbicular, shining white or ivory, longitudinally ridged or irregularly conspicuously reticulate. SANTA CRUZ: SARA: Cucichisito, 450 m., *Steinbach* 7014 (GH).

2. ***S. hirtella*** Swartz, Prodr. 19 (1788). Perennial, with a long slender rhizome. Culms to 6.5 dm. high, sharply triangular, slender,

glabrous, sometimes pubescent near the apex. Leaves to 2 dm. long and 5 mm. wide, pubescent to glabrous; sheaths pilose, at least in a vertical line below the orifice, ligule usually absent (minute, if present). Inflorescence terminal, simple, interrupted, the spikelets aggregated in small, sessile, remote, glomerulate heads, the rachis sparsely to densely pilose; bractlets not exceeding the glomerule, long-pilose or hirsute. Staminate scales narrow, brown, dorsally hirsute. Pistillate scales cuspidate, brown, broader than staminate scales. Spikelets 4-5 mm. long, brown, red-brown, or almost black; hypogynium absent; achene subglobose-trigonous, smooth, white, shining, apiculate, the base not or only slightly excavated. LA PAZ: LARECAJA: Hacienda Casana, 1400 m., *Buchtien* 7165 (GH). SANTA CRUZ: SARA: Buenavista, 450-500 m., *Steinbach* 1802 (GH), 5327 (GH), 6861 (GH).

3. *S. leptostachya* Kunth, Enum. Pl. 2: 354 (1837). Perennial, with a long rhizome. Culms to 6 dm. high, filiform. Leaves to 3 dm. long, 1 mm. wide, blades glabrous; sheaths more or less pilose, ligule absent. Inflorescence terminal, interrupted, simple (sometimes few-branched), the spikelets aggregated in small heads; rachis ciliolate on the angles, otherwise glabrous; bractlets basally dilated, setaceous, glabrous. Spikelets to 5 mm. long, linear-oblong, obtuse. Staminate and pistillate scales reddish-brown, acuminate, membranous, glabrous, oblong, the pistillate much exceeding the achenes; hypogynium absent; achene short-stipitate, subglobose, white or dirty-white, transversely rugulose or nearly smooth, 1 mm. long. SANTA CRUZ: SARA: Buenavista, 500 m., *Steinbach* 5300 (GH).

4. *S. lithosperma* (L.) Swartz, Prodr. 18 (1788). Perennial, with short, nodulose rhizomes. Culms filiform, triangular, glabrous above, the angles often scabrid-ciliate below, to 6 dm. tall. Leaves to 2 dm. long and 3 mm. wide, margins scabrid; sheaths pilose to glabrous, ligule triangular, short, pilose. Inflorescences terminal and axillary, simple or branched, interrupted, the few spicate heads remote, few-flowered. Spikelets to 4 mm. long, bracts filiform, much exceeding the heads, bractlets dark brown; scales dark brown, ovate-lanceolate; hypogynium absent; achene to 2.5 mm. long, white, shining, smooth, oblong, basally attenuate, trigonous, the apex more or less umbonate. SANTA CRUZ: SARA: Buenavista, 500 m., *Steinbach* 5203 (GH).

As noted by Core, this collection is distinctive in that there are 2 narrow red-brown lobes at 2 corners of the base of the achene. These lobes may be entire or apically bifid, ciliolate or glabrous.

5. *S. castanea* Core in Brittonia, 1: 239 (1934). *S. pleostachya* of the Catalogue. Perennial, the rhizome thick. Culms to 8 dm. tall, acutely triangular, the angles scabridulous. Leaves to 4.5 dm. long and 3 mm. wide, somewhat short-pilose along the margins and the

midrib beneath; sheaths reddish-purple, pubescent, the ligule shortly pilose, obtusely triangular. Inflorescence a terminal panicle, few-branched. Bracts setaceous. Spikelets to 7 mm. long, oblong or linear-oblong, densely clustered. Staminate scales red-brown, acuminate. Pistillate scales red-brown, lance-ovate; hypogynium absent; achene to 2 mm. long, oblong-ovoid, obscurely trigonous, apiculate, shining white and smooth, the triangular base narrowed. YUNGAS: *Bang* 203 (GH). COCHABAMBA: CHAPARE: Locotal, 1700 m., *Steinbach* 9068 (GH; type-number). SANTA CRUZ: SARA: Cerro Hosana, *Steinbach* 3421 (GH).

6. *S. composita* (Nees) Boeckl. in *Linnaea*, 38: 444 (1874). Perennial from a slender rhizome. Culms to 6 dm. tall, slender, triangular. Leaves to 2 dm. long and 2-5 mm. wide, pilose beneath and sparsely pilose to glabrous above; sheaths glabrous to densely ciliate, ligule rounded, ovate, pilose. Inflorescence terminal, densely spicate, the rachis sparsely to densely pilose; bracts setaceous (if present); bractlets setaceous, hairy, mostly not exceeding the spikelets. Spikelets brown, 2-3 mm. long; staminate scales lanceolate, to 4 mm. long; pistillate scales with pilose keel; hypogynium none, or almost none; achene obscurely trigonous, white or dirty-white, irregularly reticulate, mucronate, 1 mm. long. SANTA CRUZ: SARA: Buenavista, 450 m., *Steinbach* 6891 (GH).

7. *S. macrophylla* Presl, *Rel. Haenk.* 1: 200 (1830). *S. paludosa* of the Catalogue. Perennial, with thick rhizomes. Culms 1-3 m. tall, acutely triangular, the angles scabridulous, thick. Leaves to 4 dm. long and 4.5 cm. wide, the angles and margins scabridulous; sheaths triolate, the wings scabridulous, ligule ovate, obtuse, short. Inflorescence an axillary and terminal panicle with erect branches; bract leaf-like, bractlets setaceous, basally pubescent. Staminate spikelets to 4 mm. long, the scales lanceolate, acuminate-acute, puberulent. Pistillate scales broad, more or less puberulent, ciliate; hypogynium conspicuous, undulate, the margin ciliate; achene to 6 mm. long, subglobose, but very obscurely subtrigonous, white or dirty-white to pale brown, smooth, shining, the puberulent style-base persistent. SANTA CRUZ: SARA: Buenavista, 450 m., *Steinbach* 1465 (GH), 8021 (GH).

8. *S. microcarpa* Nees ex Kunth, *Enum. Pl.* 2: 341 (1837). Perennial from elongate rhizomes. Culms to 2 m. high, acutely triangular, glabrous. Leaves to 4 dm. long and 1 cm. wide, glabrous; sheaths triolate, glabrous, the lanceolate glabrous ligule to 1 cm. long. Inflorescence of terminal and axillary panicles, the branches erect, spikelets somewhat remote; bract foliar, bractlets very small, more or less subulate. Staminate spikelets oblong-ovate, with obtuse, ovate, straw-colored scales. Pistillate scales suborbicular, straw-colored; hypogynium undulate and densely ciliate; achene ovoid, to 2 mm. long,



smooth, white to pale buff, the style-base somewhat persistent. SANTA CRUZ: ICHILO: Río Vibora, 350 m., *Steinbach* 7564 (GH).

In its original use, in *Linnaea*, 9: 302 (1834), this binomial was a *nomen nudum*. Kunth's validation of the name in 1837 is the earliest known to me.

9. *S. mitis* Berg. in Vet. Akad. Handl. Stockh. 27: 145, t. 5 (1765). Perennial, from moderately thick rhizomes. Culms to 3 m. tall, sharply triangular, smooth, rather thick. Leaves to 6 dm. long and 2.5 cm. wide, subplicate, the margins and nerves on the upper surface scabrid; sheaths trialate, glabrous, the lanceolate to long-deltoid ligule glabrous, to 3 cm. long (usually shorter). Inflorescence paniculate, lax, the branches erect; bract foliar, bractlets setaceous, short. Spikelets about 2 mm. long, ovoid-elliptic; pistillate scales orbicular, shortly acuminate; hypogynium with an undulate ciliate margin, the hairs dense, long, red-brown; achene ellipsoid-conic, 2-3 mm. long, white, smooth, the black style-base persistent. SANTA CRUZ: SARA: Buena-vista, 500 m., *Steinbach* 2866 (GH).

10. *S. obtusa* Core in Brittonia, 1: 240 (1934). Probably perennial (rhizomes lacking in material seen). Culms to 7.5 dm. high, slender, triangular, slightly scabridulous. Leaves to 2 dm. long and 1 cm. wide, scabridulous, especially on the upper surface; sheaths trialate (sometimes narrowly so), ligule narrow, 2-4 mm. long. Inflorescence a terminal and axillary few-branched panicle, the branches erect; bract long, slender. Spikelets to 2 mm. long, the pistillate scales brown, suborbicular, abruptly short-acuminate or apiculate; hypogynium brown or purplish-brown, the undulate margin ciliate; achene 2-3 mm. long, oblong-globose, the apex somewhat tapering, obtuse, shining white, smooth. BENI: YACUMA: Hacienda Rosario, 300 m., *White* (M. E.) 1224 (type-number; Gray Herbarium sheet mixed with *Scleria hirtella*).

11. *S. cyperinoides* C. B. Clarke in Kew Bull. Add. Ser. 8: 61 (1908). Perennial from a rather thick rhizome. Culms to 1 m. high, sharply triangular, the angles scabridulous. Leaves to 3 dm. long and 1.6 cm. wide, the margins and prominent veins scabrid beneath; sheaths narrowly trialate, wing-margins scabrid, ligule ovate, conspicuous, membranous, to 1.5 cm. long. Inflorescence a dense terminal panicle, the rachis sparsely pilose to puberulent; bract long, foliar, bractlets subulate or setaceous. Staminate spikelets subsessile, numerous, the acuminate scales lanceolate, purplish. Pistillate scales lance-ovate, purplish; hypogynium 3-lobed, the lobes deeply dissected into several teeth; achene to 3 mm. long, shorter than the pistillate scales, verrucose, puberulent, especially near the apex, ovoid, subtrigonous (the angles rounded), usually purplish. SANTA CRUZ: ICHILO: Río Vibora, 350 m., *Steinbach* 7575 (GH).

12. *S. arundinacea* Kunth, Enum. Pl. 2: 347 (1837). Perennial from a short thick rhizome. Culms to 2 m. tall, triangular, the angles scabridulous. Leaves few, to 5 dm. long and sometimes to 5 cm. wide, glabrous, plicate or subplicate, abruptly narrowed to an acuminate tip; sheaths broadly triolate, inflated, pubescent, especially near the ovate ligule. Inflorescence an axillary and terminal panicle, purple, the rachis scabrid; bract foliar, to 2.5 dm. long, bractlets setaceous, to 2 cm. long. Staminate spikelets to 3 mm. long, lanceolate. Pistillate scales ovate, purplish, midrib green; hypogynium 3-lobed, lobes fimbriate, fimbriae to 1 mm. long, purple; achene to 3 mm. long, depressed-globose, shining, smooth, purplish to black (portions shielded by scales often whitish). LA PAZ: LARECAJA: San Carlos, Mapiri, 850 m., *Buchtien* 338 (NY).

13. *S. latifolia* Swartz, Prodr. 18 (1788). Perennial from a thick rhizome. Culms to 1 m. tall, triangular, short-pilose (at least on the upper portion). Leaves to 6 dm. long and 5 cm. wide, abruptly acuminate at the apex, the margins and principal nerves scabridulous on lower surface; sheaths triolate, puberulent to shortly pubescent, the deltoid-ovate ligule to 8 mm. long, sometimes pubescent. Inflorescence an axillary and terminal panicle, brownish, the peduncles pubescent; bract to 1.5 dm. long, foliar, bractlets filiform. Staminate spikelets lanceolate, to 4 mm. long, short-pedicellate. Pistillate spikelets with membranous, brown, puberulent, ovate scales; hypogynium 3-lobed, the lobes deeply toothed or fimbriate; achene depressed-globose, to 3 mm. long, shorter than the pistillate scales, smooth, white to purple. LA PAZ: LARECAJA: San Carlos, Mapiri, *Buchtien* 1227 (US); Hacienda Casana, *Buchtien* 7161 (US).

The only marked difference between *S. latifolia* and *S. arundinacea* seems to be in the color of the inflorescence and achene. This hardly seems to warrant retention of two "species", especially as the two are sympatric. The range of *S. latifolia* is apparently entirely included in that of *S. arundinacea*.

14. *S. panicoides* Kunth, Enum. Pl. 2: 348 (1837). Perennial from a thick rhizome. Culms to 2 m. high, triangular, sparsely pilose, the angles scabrid. Leaves to 3 dm. long and 5 cm. wide, sparsely pubescent; sheaths triolate, pubescent, the short ovate ligule densely pubescent to pilose. Inflorescence of axillary and terminal purplish panicles, the rachis and branches pubescent to puberulent; bract foliar, bractlets filiform, long. Staminate spikelets to 4 mm. long, ellipsoid-oblong, the scales purplish. Pistillate scales suborbicular, pubescent, acuminate; hypogynium 3-lobed, laciniate, purple; achene depressed-globose, to 4 mm. long, whitish, shining, rugose-tuberculate, the tubercles puberulent or glabrous. Without data: *Bang* 2350 (GH).

15. *S. bracteata* Cav. Ic. 5: 34, t. 457 (1799). *S. bracteata* f. *simplior* Kükenth. in Fedde, Rep. Sp. Nov. 26: 253 (1929). Perennial from a thick rhizome. Culms to 3 m. long, triangular, scandent or subscandent. Leaves to 4.5 dm. long and 1.8 cm. wide, pubescent on both surfaces, tapering to a long-caudate tip; sheaths shortly villous, often purple-tinged, the ovate ligule to 4 mm. long, pubescent. Inflorescence a terminal and axillary panicle, with the staminate and pistillate portions separate. Pistillate inflorescence: bracts to 7 cm. long, filiform, scabrid; spikelets few-flowered, lance-ovate, cuspidate, purple; hypogynium 3-lobed, the margin purple, entire or dentate; achene subglobose, to 3 mm. long, white or dirty-white, subtuberculate to verrucose, the tubercles puberulent. YUNGAS: *Bang* 262 (GH). LA PAZ: LARECAJA: Hacienda Simaco, 1400 m., *Buchtien* 5102 (GH), 5107 (GH); Hacienda Casana, 1400 m., *Buchtien* 7164 (GH); NOR YUNGAS: Polo-Polo, 1100 m., *Buchtien* 3652 (GH); Hacienda El Choro, *Buchtien* 8067 (GH). SANTA CRUZ: SARA: Buenavista, 450 m., *Steinbach* 7038 (GH).

16. *S. setacea* Poir. Encycl. 7: 4 (1806). Annual or perennial, with fibrous roots or a short rhizome. Culms to 8 dm. high, diffuse, triangular. Leaves long, linear, 1-4 mm. wide, glabrous or sparsely pilose; sheaths glabrous, sometimes alate, the short ligule rounded. Inflorescence of terminal and axillary panicles, the lateral peduncles very slender, drooping; bracts linear or lance-linear, mostly exceeding the culms, bractlets linear to subulate. Spikelets 2-4 mm. long. Pistillate scales lance-ovate, acuminate, straw-colored to purplish; hypogynium prominently 3-lobed; achene globose to ellipsoid, 2 mm. long, reticulate, the ridges pubescent, dirty-white. SANTA CRUZ: SARA: Buenavista, 500 m., *Steinbach* 5425 (GH).

17. *S. tenacissima* (Nees) Steud. Syn. Pl. Cyp. 175 (1855). Base not seen, plant scandent. Culms to 3 dm. tall, clustered at nodes of the principal axes, triangular, the angles scabrid. Leaves to 3 dm. long and 4 mm. wide, pilose on both surfaces; sheaths pubescent to glabrous, angled, the angles scabrid, the rounded short ligule pilose. Panicles few (1-3) at ends of branches, rachis pilose; bracts foliar, bractlets setaceous. Spikelets to 4 mm. long, the scales lanceolate, pubescent; hypogynium somewhat 3-lobed; achene globose, to 3 mm. long, white, reticulate-tuberculate. LA PAZ: LARECAJA: San Carlos, *Buchtien* 1235 (US). COCHABAMBA: CHAPARE: Puerto Polonia, *Cárdenas & Cutler* 7348 (GH).

18. *S. lagoënsis* Boeckl. in Vidensk. Meddel. Kjoebenh. 1869: 151 (1870). Perennial from a rather thick rhizome. Culms to 7 dm. high, triangular, the angles scabrid. Leaves to 3 dm. long and 7 mm. wide, the margins and nerves scabrid; sheaths puberulent, the ovate ligule short, pilose on the margins. Inflorescence a terminal and axillary panicle, spikelets few in a cluster; bract foliar, bractlets subulate,

long-attenuate. Staminate spikelets oblong, the scales lanceolate. Pistillate scales lance-ovate, acute to mucronate, brownish, exceeding the achenes; hypogynium 3-lobed, the lobes small, acute; achene 2-3 mm. long, ovoid, white, subreticulate and very sparsely puberulent. LA PAZ: NOR YUNGAS: Milliguaya, *Buchtien* 4283 (US).

19. *S. vaginata* Steud. Syn. Pl. Cyp. 179 (1855). Base unknown, but the plant probably perennial. Culms to 1 m. tall, acutely triangular, the angles scabrid. Leaves to 6 dm. long and 1 cm. wide, exceeding the inflorescence, glabrous, the nerves of lower surface scabrid; sheaths glabrous, broadly triolate, the wings scabrid, the obtusely rounded glabrous ligule to 1 cm. long. Inflorescence a much-branched purplish panicle; bracts foliar, bractlets subulate. Staminate spikelets to 5 mm. long, few-flowered, scales lance-oblong, acuminate. Pistillate spikelets lance-ovate, purplish, acuminate, the scales exceeding the achenes; hypogynium small, obscurely 3-lobed; achene 3-4 mm. long, ovoid, shining, smooth, white (often tinged with purple). LA PAZ: LARECAJA: San Carlos, Mapiri, 750 m., *Buchtien* 1284 (GH).

20. *S. melaleuca* Reichb. ex Schlechtd. & Cham. in *Linnaea*, 6: 29 (1831). Perennial from a rhizome. Culms to 9 dm. high, usually glabrous, narrowly triolate, the wings scabrous, the lance-ovate ligule to 1 cm. long, glabrous or pubescent. Inflorescence paniculate, terminal and axillary, purple or brownish-purple; bract foliar, bractlets subulate, ciliate. Staminate scales reddish-brown, lanceolate. Pistillate scales purple, suborbicular, acuminate; hypogynium 3-lobed, the lobes rounded, brown; achene subglobose, 2 mm. long, smooth and shining, purplish, occasionally with short pubescence near the base. LA PAZ: LARECAJA: San Carlos, Mapiri, *Buchtien* 333 (NY). SANTA CRUZ: SARA: Buenavista, 450 m., *Steinbach* 6950 bis (GH).

This is probably better treated as a variety of the next species, *S. pterota*. There seems to be almost no distinguishing mark aside from the color of the inflorescence. Since the latest monographer of the genus has retained them as species, as was also true of *S. arundinacea* and *S. latifolia*, I have followed his example, reluctantly.

21. *S. pterota* Presl in *Isis*, 21: 268 (1826). Perennial from a thick rhizome. Culms to 3 m. tall, triangular, the angles scabrid, glabrous. Leaves to 4.5 dm. long and 1.5 cm. wide, the margins scabrid; sheaths narrowly triolate, the triangular ligule pilose, to 1 cm. long. Inflorescence of axillary and terminal panicles, greenish or yellowish-brown (sometimes purplish); bract foliar, large, bractlets filiform. Staminate scales lanceolate, acuminate, greenish-brown or tinged with purple. Pistillate scales orbicular, acuminate, stramineous; hypogynium 3-lobed, the lobes rounded, glabrous or ciliate; achene to 2.5 mm. long,

globose or depressed-globose, smooth, white or yellowish-brown. LA PAZ: LARECAJA: Mapiri, *Rusby* 79 (NY).

22. *S. secans* (L.) Urb. Symbol. Antill. 2: 169 (1900). *S. reflexa* of the Catalogue. Perennial from a rhizome. Plants scandent, the culms to 10 m. long, triangular, the angles scabrid. Leaves long, linear, to 5 mm. wide, usually basally pubescent on the upper surface and pilose beneath; sheaths scabrid, apically pubescent, the short ligule ovate, usually with an apical scarious appendage. Inflorescence terminal and axillary; bracts foliar, bractlets filiform-subulate, pubescent. Pistillate scales ovate, glabrous, acute, dark in color; hypogynium subentire, the margin undulate; achene 2-4 mm. long, globose, shining, white or dirty-white, usually minutely puberulent. LA PAZ: LARECAJA: San Carlos, Mapiri, 850 m., *Buchtien* 329 (GH). SANTA CRUZ: SARA: Buenavista, 500 m., *Steinbach* 5308 (GH).

#### 14. UNCINIA Pers.

Stoloniferous perennials, the leaves mostly basal. Inflorescence a terminal spike, flowers unisexual; female flowers below the apical male flowers on the spike. Female flowers with a subtending scale, a 2-parted utricle, the achene with a trifid style, the rachilla of the spikelet long-exserted and apically hooked; achene oblong, obscurely trigonous. Male flowers with a smaller scale subtending 3 stamens, filaments broad.

Inflorescence narrowly cylindrical; rachilla markedly divaricate at maturity; utricles elliptic. .... 1. *U. hamata*.  
 Inflorescence clavate, broadest near the apex; rachilla hardly divaricate; utricles oblong. .... 2. *U. phleoides*.

1. *Uncinia hamata* (Swartz) Urb. Symbol. Antill. 2: 169 (1900). Plants to 7 dm. tall, the leaves exceeding the stem. Inflorescence to 2 dm. long. Female flowers: glume oblong-ovate, obtuse, ciliolate at the apex; utricles to 5-6 mm. long, exceeding the glumes, the margins coarsely hispid-ciliate, at least on the upper half; exserted portion of rachilla at least as long as the utricle, usually about 7 mm. long; achene oblong-obovate, to 4 mm. long. Male flowers: glumes shorter, abruptly obtuse. LA PAZ: NOR YUNGAS: Polo-Polo, 1100 m., *Buchtien* 3653 (GH).

2. *U. phleoides* (Cav.) Pers. Synops. Pl. 2: 534 (1806). Plants to 7.5 dm. tall, leaves to 12 mm. wide. Inflorescence to 15 cm. long. Female flowers: glume oblong, obtusely rounded, finely ciliolate in the upper portion; utricles to 5-6 mm. long, much exceeding the glumes, densely hispid on upper portion; exserted portion of rachilla much shorter than utricle in length; achene narrow, oblong, to 5 mm. long. Male flowers: glumes much shorter and proportionately broader. LA PAZ: LARECAJA: Lancha de Cochipata, 3300-3700 m., *Mandon* 1424 (GH).

## 15. CAREX L.

Perennial from a rather slender scaly rhizome. Culms mostly trigonous, the angles often scabrid or scabridulous, often clothed at the base in the fibrous remains of old leaves. Leaves mostly flat, occasionally reduced to sheaths. Inflorescence of solitary spikes, or spikes aggregated in dense capitula, or obviously paniculate. Flowers unisexual, the staminate flowers consisting of a scale and 3 stamens, borne at the base (gynaecandrous) or apex (androgynous) of a spike (in 1 species, staminate and pistillate flowers borne in separate spikes); pistillate flowers consisting of a scale subtending a specialized sac (perigynium) containing an achene; achene flattened, biconvex (lenticular) or trigonous; stigmas 2 or 3.

- a. Pistillate and staminate flowers in separate spikes on the same plant. .... 5. *C. decida*  
var. *Brehmeri*.
- a. Pistillate and staminate flowers in the same spike.
  - b. Staminate flowers at base of spike (gynaecandrous).
    - c. Achene trigonous; stigmas 3. .... 9. *C. boliviensis*.
    - c. Achene not trigonous; stigmas 2.
      - d. Perigynia pale green, plano-convex; beak long; style-base thickened. .... 3. *C. Bonplandii*.
      - d. Perigynia olivaceous to brown, concavo-convex; beak short; style-base not thickened. .... 2. *C. pinetorum*.
  - b. Staminate flowers at apex of spike (androgynous).
    - e. Achene trigonous; stigmas 3.
      - f. Achene not constricted in the middle.
        - g. Perigynia pubescent to glabrate. .... 10. *C. phalaroides*.
        - g. Perigynia glabrous. .... 4. *C. cladostachya*  
var. *maxima*.
      - f. Achene constricted in the middle. .... 8. *C. Jamesonii*  
var. *subfulva*.
    - e. Achene not trigonous; stigmas 2.
      - h. Achene biconvex and torulose. .... 7. *C. fecunda*.
      - h. Achene not biconvex, not torulose.
        - i. Perigynia green, subalate, ampullaceous, beak long. ....  
..... 1. *C. nebulareum*.
        - i. Perigynia deep chestnut or purplish-brown, not alate, not ampullaceous, beak short. .... 6. *C. pichinchensis*.

1. *Carex nebulareum* Phil. in Anal. Univ. Chile, 93: 492 (1896). Plants to 2 dm. high, the culms trigonous, scabridulous above. Leaves shorter or longer than the culms, to 4 mm. wide, the midrib prominent, at least the margins scabridulous. Inflorescence a dense, terminal, ellipsoid to ovoid, ebracteate capitulum of numerous androgynous (staminate flowers at apex) spikes. Staminate flowers: scales narrow-

ly lanceolate, to 4 mm. long, acute to somewhat mucronate, the broad margins hyaline or brown-hyaline, the rather prominent midrib brown. Pistillate flowers: scales lanceolate, broader, to 6 mm. long, acute, the margins broadly hyaline, the center pale to dark brown, midrib green; perigynium equaling or shorter than the scale, to 4 mm. long, plano-convex, the over-all shape ampullaceous, subalate, the long beak and upper wings scabrid-serrulate, apex of beak deeply bidentate; stigmas 2; achene small, flattened, pale brown. LA PAZ: MURILLO: La Paz, 3800 m., *Buchtien* 9245 (GH; det. Kükenthal).

2. *C. pinetorum* Liebm. in Vidensk. Selsk. Skr. Kjöbenhavn. (ser. 2) 5: 263 (1851). *C. Mandoniana* of the Catalogue. Culms mostly to 1 dm. tall, rarely to 3.5 dm., trigonous, the angles smooth or occasionally scabridulous. Leaves mostly shorter than the culms, to 2 mm. wide, scabridulous beneath. Inflorescence a congested ovoid capitulum of 3-5 gynaeandrous (staminate flowers at base) spikes, the bracts and bracteoles mostly setaceous. Staminate flowers: scales ovate, obtuse, brown with a green keel, the apex hyaline. Pistillate flowers: scales ovate, acute, chestnut-brown with a green keel; perigynium to 4 mm. long, slightly exceeding the scale, ovoid, concavo-convex, nerves subconspicuous, narrowly alate, the margin ciliate-scabrid, olivaceous, becoming brown, the beak medium long, reddish-brown, bidentate; stigmas 2; achene shining brown, ovoid, style-base not thickened. LA PAZ: LARECAJA: Lancha de Cochipata, 3100-4300 m., *Mandon* 1429 in part (GH; type-number of *C. Mandoniana*).

3. *C. Bonplandii* Kunth, Enum. Pl. 2: 380 (1837). Culms 3 dm. tall, trigonous, the angles scabrid. Leaves shorter or longer than the culms, to 2.5 mm. wide. Inflorescence of 4-10 densely flowered, ovate, approximate, gynaeandrous (staminate flowers at base) spikes, mostly ebracteate. Staminate flowers: scales ovate, obtuse or subobtuse, chestnut-brown, the keel green, hyaline margin broad. Pistillate flowers: scales lance-ovate, subacute, chestnut-brown, the keel green; perigynium to 3-3.5 mm. long, exceeding the scale, plano-convex, ovoid, nerves few and inconspicuous, pale green, subalate, the margins scabrid from the middle upward, beak long, reddish, bidentate; stigmas 2; achene small, ovoid, brown, style-base thickened. LA PAZ: LARECAJA: Lancha de Cochipata, *Mandon* 1429 in part (GH); MURILLO: near La Paz, 3300 m., *Bang* 62 (GH); 3700 m., *Buchtien* 9244 (GH; inflorescence like *C. pinetorum* but technical details of *C. Bonplandii*); NOR YUNGAS: Unduavi, 3200 m., *Buchtien* 6405 (US).

4. *C. cladostachya* var. *maxima* Kükenth. in Engler, Pflanzenr. IV, 20(38): 268 (1909). Culms to 5 dm. high. Leaves longer or shorter than the culms, to 1 cm. wide, scabrid above and beneath. Inflorescence paniculate or sometimes apparently racemose, the spikes short-pedicellate; basal bract foliar, exceeding the inflorescence, bracteoles setaceous, equaling or shorter than the spikes. Spikes ovoid,

solitary (occasionally paired), to 1 cm. long, androgynous (staminate flowers at apex). Staminate flowers: scales ovate, about 2 mm. long, the central portion thin, with 3 prominent ribs, light greenish-brown, the broad margins hyaline, apex slightly emarginate, midrib excurrent as a short scabridulous mucro. Pistillate flowers: scales slightly broader, thinner-textured, paler, midrib green, very prominent, mucro longer and more scabrid; perigynium about 2-3 mm. long, exceeding the scale, trigonous, ovoid-ellipsoid, the sides thickened, 3-5 nerves prominent, thin-textured, pale green, gradually contracted into the bidentate beak; achene ellipsoid, trigonous, warm brown, the angles stramineous, the sides densely and evenly papillate; stigmas 3. LA PAZ: LARECAJA: Hacienda Simaco, 1400 m., *Buchtien* 5108 (GH); MURILLO: near La Paz, *Rusby* 74 (NY). Without data: *Bang* 2210 (GH; type-number).

5. *C. decidua* var. *Brehmeri* (Boeckl.) Kükenth. in Engler, Pflanzenr. IV, 20 (38): 307 (1909). *C. Goodenowii* var. *stolonifera* of the Catalogue. Plant to 1 dm. high, culms shorter than or about equaling the leaves. Leaves to 3 mm. wide, scabridulous beneath. Inflorescence contracted, of 4-7 spikes, the uppermost staminate, the lower pistillate, bracts small but foliar, mostly exceeding the inflorescence. Staminate flowers: scales to 2.5 mm. long, cuneate to spatulate, obtuse, brown, the midrib and central portion green. Pistillate flowers: scales to 2 mm. long, ovate to obovate, subacute, warm deep brown with a narrow, hyaline, white margin; perigynium to 2 mm. long, not, or only slightly, exceeding the scale, plano-convex, few-nerved, ovate to lance-ovate, papillose, abruptly contracted into a very short entire beak; stigmas 2; achene nearly as large as the perigynium, flattened, finely scrobiculate, pale brown, the style-base about 0.5 mm. long. LA PAZ: LARECAJA: Cochipata, 3200 m., *Mandon* 1427 (GH; type-number of *C. Brehmeri*).

6. *C. pichinchensis* HBK. Nov. Gen. & Spec. 1: 233 (1815). Culms to 4.5 dm. high, acutely trigonous, the angles scabridulous. Leaves numerous, as long as the culms, to 7-8 mm. wide, glaucous, not scabridulous, finely nerved, the midrib usually prominent. Inflorescence a terminal panicle of several to many dense, more or less oblong, androgynous (staminate flowers at apex) spikes, the basal bract long, foliar, sometimes exceeding the inflorescence. Staminate flowers: scales narrowly ovate, to 3 mm. long, acute, deep chestnut-brown with a pale midrib. Pistillate flowers: scales ovate, acute to acuminate, to 3.5-4 mm. long, deep chestnut-brown to blackish-brown; perigynium nearly as long as the scale, ovoid, plano-convex, deep chestnut-brown or purplish-brown, abruptly contracted into a short bidentate beak; stigmas 2; achene oblong to obovoid, pale brown to stramineous, finely pitted, plano-convex. LA PAZ: LARECAJA: Ticonguaya, 3300-3800 m., *Mandon* 1426 (GH); Ingenio del Oro, 3300 m., *Rusby* 170 (GH); NOR YUNGAS: Unduavi, 3600 m., *Buchtien* 2596 (GH). SANTA CRUZ: VALLEGRANDE: Comarapa, 2800 m., *Steinbach* 8339 (NY).



6a. *C. pichinchensis* var. *obtusisquamea* R. Gross in Notizbl. 14: 193 (1938). Inflorescence small; scales obtuse or subobtuse, not acute to acuminate. COCHABAMBA: AYOPAYA: Sailapata, 3000 m., *Cárdenas* 3204 (type-number; not seen).

7. *C. fecunda* Steud. Syn. Pl. Cyp. 194 (1855). Culms to 1 m. high, acutely trigonous, the angles scabridulous. Leaves mostly as long as the culms, to 8 mm. wide, scabridulous. Inflorescence paniculate, the lower bracts foliar, the bracteoles setaceous. Spikes numerous, many-flowered, cylindric, androgynous (staminate flowers at apex). Staminate flowers: scales lance-ovate, acuminate to shortly mucronate, reddish-brown, the midsection green, about 3 mm. long. Pistillate flowers: scales like the staminate scales; perigynium a little shorter than the scale, ovoid, plano-convex, the marginal nerves thickened (almost subalate), contracted rather abruptly into a short bidentate beak, the beak-margins sometimes serrate-scabrid; stigmas 2; achene biconvex, pale to medium brown, once or twice contracted near the middle, hence somewhat torulose. LA PAZ: LARECAJA: Cochipata, 3200 m., *Mandon* 1425 (GH). SANTA CRUZ: VALLEGRANDE: Cerro San Mateo, Comarapa, 3000 m., *Steinbach* 8390 (NY).

8. *C. Jamesonii* var. *subfulva* Kükenth. in Fedde, Rep. Sp. Nov. 8: 7 (1910). Culms to 1 m. tall, but usually shorter, strongly angled, the angles scabrid. Leaves equaling the culms, to 1 cm. wide, with 2 prominent nerves on upper surface. Spikes in a panicle, androgynous (staminate flowers at apex). Scales fulvous, lanceolate, to 4 mm. long, prominently 3-nerved, the apex-margins scabrid; perigynium about equaling the scale, outwardly curved, narrowly ovoid or lanceolate, subtrigonous, nerves inconspicuous to obsolete; stigmas 3; achene trigonous, constricted (subtorulose) in the middle, the style-base not thickened. Without data: *Bang* 2376 (GH; type-number).

9. *C. boliviensis* v. Heurck & Muell. Arg. in v. Heurck, Obs. Bot. 32 (1870). Culms to 4.5 dm. high, very slender, decumbent, the upper portion scabrid on the angles. Leaves entirely basal, very much shorter than the culms, to 2-3 mm. wide. Inflorescence of 2-3 approximate spikes, the uppermost gynaeandrous (staminate flowers at base), the others pistillate, bracts short, hardly foliar, the lowermost slightly longer than the lowest spike. Spikes to 1.5 cm. long, oblong-ovoid. Staminate flowers: scales to 3 mm. long, ovate to obovate, brown, the green midrib prominent but not excurrent, the apex somewhat hyaline at the margin. Pistillate flowers: scales to 3 mm. long, broadly ovate, thin, brown, the central portion green and 3-nerved, with a short blunt mucro, or the mucro absent; perigynium exceeding the scale, lance-ovoid, with 3-5 prominent ribs dorsally and about 5 less prominent ribs ventrally, apically shortly attenuate into the short entire or subentire beak; achene obovoid, sharply trigonous, finely and evenly papillate; stigmas 3, the lower portion densely

glandular-pilose. LA PAZ: LARECAJA: near Lacatia, 3200-3300 m., *Mandon* 1428 (GH; type-number).

10. *C. phalaroides* Kunth, Enum. Pl. 2: 482 (1837). Culms to 2 dm. tall, obtusely trigonous, smooth, the bases mostly clothed in fibrous remains of old leaves. Leaves exceeding the culms, to 2-3 mm. wide, smooth or scabridulous on the margins and more prominent veins. Inflorescence of 4-6 distant, androgynous (staminate flowers at apex), dense, subglobose spikes to 1 cm. long; bract foliar, exceeding the inflorescence. Staminate flowers: scales narrowly elliptic-ovate, the margins whitish, central portion yellowish-green, the midrib dark green, with a thick scabrid arista less than half the length of the scale. Pistillate flowers: scales similar but much broader, the arista usually longer than the body of the scale; perigynium coriaceous, obovoid-oblong, trigonous, 3-4 mm. long, yellowish-green, densely short-pubescent (the hairs white, thick, curled), 2 lateral nerves prominent, basally long-attenuate or stipitate, the apex abruptly contracted into a short entire beak; achene obovoid, trigonous, the somewhat thickened style-base about half the length of the achene; stigmas 3. TARIJA: MENDEZ: Tucumilla, *Fiebrig* 2639 (Barros). LA PAZ: MURILLO: La Paz, 3800 m., *Buchtien* 6407 (US).

10a. *C. phalaroides* var. *moesta* (Kunth) Kükenth. in Verhandl. Bot. Ver. Brandenb. 47: 208 (1905). Taller (to 3 dm.), leaves narrower (1-2 mm.). Spikes oblong-clavate, distant, androgynous. Perigynium shorter, the base shortly or hardly at all stipitate, the beak shorter and its apex shortly notched or emarginate. Without data: *Bang* 1870 (GH). LA PAZ: LARECAJA: Cerro del Iminapi, 2650-3950 m., *Mandon* 1430 (GH).

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